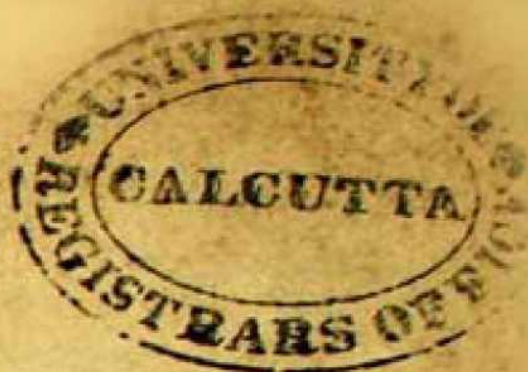




JOURNAL



OF THE

ASIATIC SOCIETY OF BENGAL,

EDITED BY

THE SECRETARIES.

VOL. XXI.

Nos. I. to VII.—1852.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish if such communications shall be long intermitted; and it will die away if they shall entirely cease."—SIR WM. JONES.

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1853.



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\* Withdrawn by the author, as irrelevant to his paper on the Dust Whirlwinds.

† Not received vide Note at the foot of page 621.



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Pages 331 and 332 in No. IV. are to be replaced by the two pages of the same figures published in No. VII.

\* Not received : vide note at the foot of page 621.



Table showing the correction to be applied to a Barometer with a Brass Scale, extending from the Cistern to the Top of the Mercurial Column, to reduce the Observation to 32° Fahrenheit.

Temperature Fahrenheit.	OBSERVED HEIGHTS OF THE BAROMETER IN INCHES.																		
	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9
50	.054	.054	.054	.055	.055	.055	.055	.055	.056	.056	.056	.056	.056	.057	.057	.057	.057	.058	.058
51	.057	.057	.057	.057	.057	.058	.058	.058	.058	.058	.059	.059	.059	.059	.059	.060	.060	.060	.060
52	.059	.059	.059	.060	.060	.060	.060	.061	.061	.061	.061	.061	.062	.062	.062	.062	.063	.063	.063
53	.062	.062	.062	.062	.062	.063	.063	.063	.064	.064	.064	.064	.064	.064	.065	.065	.065	.066	.066
54	.064	.064	.065	.065	.065	.065	.065	.066	.066	.066	.066	.067	.067	.067	.067	.068	.068	.069	.069
55	.067	.067	.067	.067	.068	.068	.068	.068	.068	.069	.069	.069	.069	.070	.070	.070	.071	.071	.071
56	.069	.069	.070	.070	.070	.070	.071	.071	.071	.071	.072	.072	.072	.072	.073	.073	.073	.074	.074
57	.072	.072	.072	.072	.073	.073	.073	.073	.074	.074	.074	.074	.075	.075	.075	.076	.076	.076	.077
58	.074	.074	.075	.075	.075	.075	.076	.076	.076	.076	.077	.077	.077	.077	.078	.078	.079	.079	.080
59	.077	.077	.077	.077	.078	.078	.078	.078	.079	.079	.079	.080	.080	.080	.080	.081	.081	.082	.082
60	.079	.079	.080	.080	.080	.080	.081	.081	.081	.082	.082	.082	.083	.083	.083	.084	.084	.085	.085
61	.082	.082	.082	.082	.083	.083	.083	.084	.084	.084	.084	.085	.085	.085	.086	.086	.087	.087	.088
62	.084	.084	.085	.085	.085	.086	.086	.086	.086	.087	.087	.087	.088	.088	.088	.089	.089	.090	.090
63	.087	.087	.087	.087	.088	.088	.088	.089	.089	.089	.090	.090	.090	.091	.091	.091	.092	.092	.093
64	.089	.089	.090	.090	.090	.091	.091	.091	.092	.092	.092	.093	.093	.093	.093	.094	.094	.095	.095
65	.092	.092	.092	.093	.093	.093	.093	.094	.094	.094	.095	.095	.095	.096	.096	.096	.097	.097	.098
66	.094	.094	.095	.095	.095	.096	.096	.096	.097	.097	.097	.098	.098	.098	.099	.099	.099	.100	.100
67	.097	.097	.097	.098	.098	.098	.099	.099	.099	.100	.100	.100	.101	.101	.101	.102	.102	.103	.103
68	.099	.099	.100	.100	.100	.101	.101	.101	.102	.102	.103	.103	.103	.104	.104	.104	.105	.106	.106
69	.102	.102	.102	.103	.103	.103	.104	.104	.104	.105	.105	.105	.106	.106	.107	.107	.108	.109	.109
70	.104	.104	.105	.105	.105	.106	.106	.107	.107	.107	.108	.108	.108	.109	.109	.110	.110	.111	.111
71	.106	.107	.107	.108	.108	.108	.109	.109	.110	.110	.110	.111	.111	.111	.112	.112	.113	.114	.114
72	.109	.109	.110	.110	.111	.111	.111	.112	.112	.112	.113	.113	.114	.114	.114	.115	.116	.117	.117
73	.111	.112	.112	.113	.113	.113	.114	.114	.115	.115	.115	.116	.116	.117	.117	.118	.118	.119	.119
74	.114	.114	.115	.115	.116	.116	.116	.117	.117	.118	.118	.118	.119	.119	.120	.120	.121	.122	.122
75	.116	.117	.117	.118	.118	.119	.119	.119	.120	.120	.121	.121	.121	.122	.122	.123	.123	.124	.124
76	.119	.119	.120	.120	.121	.121	.121	.122	.122	.123	.123	.124	.124	.124	.125	.125	.126	.127	.127
77	.121	.122	.122	.123	.123	.124	.124	.124	.125	.125	.126	.126	.127	.127	.127	.128	.128	.129	.129
78	.124	.124	.125	.125	.126	.126	.127	.127	.127	.128	.128	.129	.129	.130	.130	.131	.131	.132	.132
79	.126	.127	.127	.128	.128	.129	.129	.130	.130	.130	.131	.131	.132	.132	.133	.133	.134	.135	.135



Temperature Fahrenheit.	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	30.0	30.1	30.2	30.3	30.4
80	129	129	130	130	131	131	132	132	133	133	133	134	134	135	135	136	136	137	137	138	138	139	139	139
81	131	132	132	133	133	134	134	135	135	136	136	137	137	137	138	138	139	139	140	140	141	141	142	142
82	134	134	135	135	136	136	137	137	138	138	139	139	140	140	141	141	141	142	142	143	143	144	144	145
83	136	137	137	138	138	139	139	140	140	141	141	142	142	143	143	144	144	145	145	146	146	147	147	148
84	139	139	140	140	141	141	142	142	143	143	144	144	145	145	146	146	147	147	148	148	149	149	150	150
85	141	142	142	143	143	144	144	145	145	146	146	147	147	148	148	149	149	150	150	151	151	152	152	153
86	144	144	145	145	146	146	147	147	148	148	149	149	150	150	151	151	152	153	153	154	154	155	155	156
87	146	147	147	148	148	149	149	150	150	151	152	152	153	153	154	154	155	155	156	156	157	157	158	158
88	149	149	150	150	151	151	152	152	153	154	154	155	155	156	156	157	157	158	158	159	159	160	160	161
89	151	152	152	153	153	154	154	155	156	156	157	157	158	158	159	159	160	160	161	161	162	163	163	164
90	154	154	155	155	156	156	157	158	158	159	159	160	160	161	161	162	163	163	164	164	165	165	166	166
91	156	157	157	158	158	159	160	160	161	161	162	162	163	163	164	165	165	166	166	167	167	168	168	169
92	159	159	160	160	161	162	162	163	163	164	164	165	165	166	167	167	168	168	169	169	170	171	171	172
93	161	162	162	163	163	164	165	165	166	166	167	168	168	169	169	170	170	171	172	172	173	173	174	174
94	164	164	165	165	166	167	167	168	168	169	169	170	171	171	172	172	173	174	174	175	175	176	176	177
95	166	167	167	168	169	169	170	170	171	171	172	173	173	174	174	175	176	176	177	177	178	179	179	180
96	169	169	170	170	171	172	172	173	173	174	175	175	176	176	177	178	178	179	179	180	181	181	182	182
97	171	172	172	173	174	174	175	175	176	177	177	178	178	179	180	180	181	181	182	183	183	184	185	185
98	174	174	175	175	176	177	177	178	179	179	180	180	181	182	182	183	183	184	185	185	186	187	187	188
99	176	177	177	178	179	179	180	180	181	182	182	183	184	184	185	185	186	187	187	188	189	189	190	190
100	179	179	180	180	181	182	182	183	184	184	185	186	186	187	187	188	189	189	190	191	191	192	193	193
101	181	182	182	183	184	184	185	186	186	187	187	188	189	189	190	191	191	192	193	193	194	195	195	196
102	184	184	185	185	186	187	187	188	189	189	190	191	191	192	193	193	194	195	195	196	197	197	198	199
103	186	187	187	188	189	189	190	191	191	192	193	193	194	195	195	196	197	197	198	199	199	200	201	201
104	188	189	190	190	191	192	192	193	194	194	195	196	197	197	198	199	199	200	201	201	202	203	203	204
105	191	192	192	193	194	194	195	196	196	197	198	198	199	200	200	201	202	202	203	204	205	205	206	207
106	193	194	195	195	196	197	198	198	199	200	200	201	202	202	203	204	204	205	206	206	207	208	209	209
107	196	197	197	198	199	199	200	201	201	202	203	204	204	205	206	206	207	208	208	209	210	211	211	212
108	198	199	200	200	201	202	203	204	205	205	206	206	207	208	208	209	210	210	211	212	212	213	214	215
109	201	202	202	203	204	204	205	206	207	207	208	209	209	210	211	212	212	213	214	214	215	216	217	217
110	203	204	205	205	206	207	208	208	209	210	211	211	212	213	213	214	215	216	216	217	218	218	219	220



*Errata in Major Abbott's Notice on the Sites of Boukephalon and Nikaia.*

Journ. As. Soc. page 227, A. D. 1852.

Page	217	line	1	for Nitab read Niláb.
"	218	"	5	omit " that Lower."
"	218	"	12	for Potawar read Potowár.
"	218	"	16	for Jain read Jani.
"	219	"	15	for one half read one and half.
"	219	"	2	from bottom, for Kándá read Kawd.
"	220	"	8	for Bhinleur read Bhinbur.
"	222	"	24	et sequentia.
"	"	"		for Kándá read Kawd.
"	228	"	26	for Buramoola read Bárámoolla.
"	130	"	15	for receives read delves.
"	235	para.	7th	to form a note.
"	236	line	2	for βωμος read βωμοι.
"	236	"	16	for γαιω read γαισω.
"	236	"	4	from bottom, for ages read eyes.
"	237	"	15	for years read gems.
"	237	note		for Tahitta read Tehitta.
"	237	line	2	from bottom, for on read or.
"	239	"	12	for Tâhi read Tohi.
"	248	"	20	for Bhara read Bhôra.
"	249	"	1	from bottom, for evidence read existence.
"	249	Note	1st.	for Chowkan read Chowhan.
"	250	line	3	for Pultun read Puttun.
"	256	"	1	for Soorhsilla read Soorksilla.
"	256	"	27	for Publi read Pukli.
"	256	"	6	from bottom, for Chok read Tchoh.
"	256	"	1	" " for Taxili read Taxila.
"	257	"	22	for Satur of read Qatur and
"	258	"	23	for Jilha read Tihla.
"	261	"	2	for Chehl read Chhylo.
"	"	"	"	for Morgulla read Margulla.
"	"	"	4	for Hurrah read Hurrôh.
"	"	"	5	for " son, Polemocrat, to" read "to Polemocrates at."
"	263	"	12	for Taxila read Taxili.





# *Errata in Catalogue of Banda plants.*

Page	26	no.	43	for Abubilon read Abutilon.
"	29	"	110	for Amplia read Cœnopia.
"	31	"	164	for Vajinalis read vaginalis.
"	—	"	166	for Buplearifolius read Bupleurifolius.
"	32	"	172	for Pupicola read rupicola.
"	—	"	187	for Dujenensis read ougeinensis.
"	33	"	214	for Schonden read Sehonda.
"	34	"	238	for Combutum read Combretum.
"			242	for Anagripus read Anageissus.
"	37	"	295	for Hephogyne panifolia read Stephogyne parvifolia.
"			last line	„ VENOONACEÆ read VERNONIACEÆ.
"	38	"	306	for Vimonia read Vernonia.
"			312	for Adenostemnea read Adenostemma.
"	39	"	5th line	„ SCORECIONIDÆ read SENECTIONIDÆ.
"	—	"	341	for Tilago read Filago.
"	—	"	348	for Endura read Endivia.
"	41	"	369	for Thevetia read Thevenotia.
"			388	for Cam read Ken.
"			389	for Reesawre read Rasaura.
"	42	"	397	for Exaceum read Exacum.
"	43	"	427	for Muricapis read muricata.
"			428	for Lonthe read Loretha.
"	44	"	435	for unifolium read brevifolium.
"			448	for Hemodia read Stemodia.
"			451	for Hysanthes read Ilysanthes.
"			498	for Ahioides read Echioides.
"	47	"	527	for Bi read Poi.
"	48	"	535	for Alvensis read arvensis.
"			544	for Seet Penicaria read Sect. Persicariæ.
"			545	for Seet read Sect.
"	151	"	546	for Sub. read Sect.
"	153	"	590	for Pezolzoo read Pozolzon.
"	154	"	602	for Reonetri read Reonchi.
"			613	for point read fruit.
"	155	"	621	for Perrica read persica.
"	156	"	640	for Khundah read Khandêh,
"	157	no.	660	} for Nov. read Nees.
"			666	
"			676	
"	158	"	701	for Nov. read Nees.
"	161	"	749	for Melanocluchris read melanocenchris.
"	164	line	22	for Elleutræacæ read Illecebræacæ.
"	165	"	23	for Myssenacæ read Myrsinacæ.
"			30	for Begrimiæacæ read Bignoniæacæ.
"			31	for Pedulineæ read Pedalineæ.
"	166	"	5	for Nyctajineæ read Nyctagineæ.
"	167	"	7 cols.	8 and 9 for 4 0 4 read 1 4 5
"				(Total to be corrected accordingly.)
"			27	for Marga read marfa.
"	168	"	30	for fœcibus read faciebus.



# *Errata.*

Page 172	no. "	"	2 and 3 from bot. Vemonia read Vernonia.
" 174	"	14	for Sepilibus read sessilibus.
		23	for inferiore read interiore.
		33	for Duaisne read Decaisne.
" 175	"	5 & 10	for Sepilibus read sessilibus.
		24	insert a comma after brevioribus.
		32	for prominculo read prominulo.
		37	for FLUVIALIS read GLABRA.
" 176	"	5	for quincuneilibus read quincuncialibus.
		11	for embryon read embryone.
" 177	"	6	for Hansi read Lauri.
		31	for now read new.
		32	for Alnus read Ulmus.
" 178	"	27	for Semilatis read serrulatis.
" 179	"	passim	for nervea read nervi.
		30	for B read 3.
		36	for tryaline read hyalina.
" 182	"	30	ANTHISTIVIA read ANTHISTIRIA.

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# JOURNAL

OF THE

# ASIATIC SOCIETY.

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No. I.—1852.

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*A Tale by Inshá Allah Khán. Communicated and translated by  
L. CLINT, Esq., Principal of La Martiniere College, Lucknow.*

The tale submitted to the Society was placed in my hands by Dr. Sprenger for publication and translation, in consequence of his not being able from want of time to perform the task himself. Before he became aware that he would not be able to fulfil his intentions, he had drawn up the following notice of the subject, which, with his permission, I introduce.

“The Biography of this poet is in Garcin de Tassy’s excellent *Histoire de la Littérature Hindoustanie*. He flourished in the beginning of this century at Lucknow. Besides this tale, a masnawý, and some minor compositions, he left a dywan, which is in our library, and he is the author of a great portion of the Daryâe Laṭafat, which has lately been printed at Murshidâbâd.”

“I found a copy of this Tale in the Moty Maḥall library at Lucknow and had it transcribed. Its value consists in a peculiarity of style; though pure and elegant Urdu and fully intelligible even to the Musalmans of the Court of Dehlee or Lucknow, it does not contain one Persian word, whereas the language usually spoken by fashionable persons in these two cities is almost purely Persian. In Lucknow in particular the Hindée words are very sparingly used. This is much to be regretted, because the people of the villages and even the Hindus in the city who are neither directly nor indirectly connected with



the court speak pure Hindee and even the educated hear in their zanánahs and in their childhood a language containing a great admixture of Hindee words. The Persian Urduo which they write is therefore even to them foreign and artificial and conveys no force. Another mischief is that by removing the written language wider and wider from the idiom of the people they preclude the millions from obtaining information, and prepare the ruin of the literature which of late years they have been cultivating. In the British territory (particularly at Agra, Dehlee and Benares) this abuse is not carried so far and many learned natives are of opinion that the Hindee element ought to be developed in Urduo in preference to the Persian. This no doubt is the right view, it being the only way of making literature popular and it is in order to further it that I publish this literary curiosity. The Asiatic Society is perhaps to be blamed for not paying more attention to the vernacular languages of India than it has done of late years; and to those who blame us for this neglect this very elegant composition will not be unwelcome."

This tale is a specimen of a class of compositions frequent in the East, not unknown in Ancient Greece, and characteristic, I believe, of every literature, when the period of its decline has arrived. The common feature to which I allude is that of writing under needlessly imposed and difficult conditions, such as the omission throughout of some letter, or a construction in which sense would be preserved if the order of the words were reversed. These curiosities cannot all be considered useless. As the fetters of rhyme have led to increased richness of style and variety of expression, so the compositions alluded to may have promoted philological learning, however little they may have contributed to the advancement of real knowledge and the increase of ideas. The piece before us seems to possess the greatest merit that works of its class can have. It is a magazine of Hindee words and phrases, and considering that the author is able to offer the usual praise to his God and Prophet without the introduction of one Arabic word, it must be considered as a good display of the powers of the language he has selected.

As many of the words used are not in Thompson's Hindee Dictionary, or the 3rd edition of Shakespeare's, I intend to make a list of the desiderata, and place it at the end of the paper.



## بسم الله الرحمن الرحيم

سر جھکا کر ناک رگرتا ہوں اوس اپنے بنائے والے کے سامنے !  
جس نے ہم سب کو بنایا اور بات کی بات میں وہ سب کر دیکھایا  
جس کا بھید کسی نے نہ پایا •

آتیاں جاتیاں ! جو سانسیں ہیں !

اوسکی بن دھیان یہہ سب پہانسیں ہیں •

یہہ کل کا پُتلا جو اپنے اوس کیلاڑی کی سُدہ رکھے تو کھٹائی  
میں کہوں پڑے ؟ اور کروا کسیلا کہوں ہو ؟ اوس پہل کی مٹھائی  
چکھ جو بزونسے بڑائی اگلوں نے چکھی ہی •

دیکھنے کو آنکھ دیں ! اور سننے کو یہہ کان دئے ! ناک بھی اونچی  
سب میں کر دی مورتوں کو جی دان دئے • مٹی کے باسن کو  
اتنی سکت کہاں ! جو اپنے کُہار کے کرتب کچھ بتا سکے ؟ سچ ہی !  
جو بنایا ہوا ہو ! سو اپنے بنائے والے کو بُرا سراہے ؟ اور کہا کہے ؟ یوں

*In the name of God the most merciful and clement.*

Having bowed the head, I rub my face in the dust before that Maker by whom we all were made, and by whom in an instant were revealed all those things of which the secret had been penetrated by none.

The breath that comes and goes, if the thought did not turn on him, would be a noose for our necks. How shall this puppet, that holds in remembrance the Being that disposes it, fall into any difficulty ? And how shall gall and bitterness be met with ? Taste the sweetness of that fruit as former generations have tasted of excellence from their elders. To see, He gave the eye ; for hearing, the ear ; the nose also he made prominent amongst all the features ; and to our forms, granted a soul. To a vessel of clay, how is it possible to declare the skill of its Maker ? The truth is, how can the created praise his Creator, and



جسکا جي چاه پڙا بڻي • سرس لگا پاڻ تلڪ جتنے رونگتے هیں • جو  
سب کے سب بول اوڻھیں اور سراھا کریں اور اتنے برسوں اسي  
دھيان میں رهیں چتني ساري نديوں میں ریت اور پھول پھلیاں  
کھیت میں هیں ت تو بهي کچھ نهو سکے •

اس سر جھکانے کے ساٿي دن رات چپتا هوں اوس داتا کے  
پھنچے هونے پيارے کو • جسکے لئے یوں کہا هی ”جو تو نهوتا ت میں  
کچھ نه بناتا •“ اور اوسکا چچيرا بهائي • جسکا بياہ اوسکے گهر هوا •  
اوسي کي سُرَت مچھے لگی رهي هی ت میں پھولا • اپنے آپ میں  
نهیں سماتا • اور جتنے اونکے لڙکے بالے هیں اونھیں کے يهاں پرچاو هی  
اور کوئي هوا • کچھ ميرے جي کو نهیں بهاتا • مچھے اس گهرانے  
کے جُھت کسی لے-بھاگ اوچک چور تھگ سے کہا پري ؟ جیتے  
مرتے اونھیں سبھونکا آسرا اور اونکے گهرانے کا رکھتا هوں تيسوں  
گھري •

what shall he say? Let him thus vainly talk, who will; not I. If as many hairs as there are from head to foot were all to speak in praise, and remain in that case as many years as there are sands in all the rivers, and blossoms and pods in the fields, even then the task could not be fulfilled.

With this bowing of the head day and night I repeat prayers in my heart to that Friend of God, far advanced in favour, on whose account it was said, “If Thou hadst not been, I would have created nothing.” And of his cousin Ali, whose marriage was contracted in his family, the remembrance has always been with me. I waxed great exceedingly, and was not able to contain myself. And as many children as there are of him, they are our salvation: for any others, I have no place in my heart. Out of the pale of this family, what have I to do with any vagabond, thief, robber, or man-slayer? In this world and the next, I place my hope day and night on them and their house.



## دول دال ایک انوکھی بات کا

ایک دن بیٹھے بیٹھے یہ بات اپنے دھیان میں چڑھ آئی ۔ کوئی کہانی ایسی کہئے جسمیں ہندوی کی آجت اور کسی بول سے نپت نہ ملے ۔ تب جا کے میرا جی بھول کی کلی کے روپ سے کھلے ۔ باہر کے بول اور گنوارے کچھ اوسکے بیچ نہو ۔ اپنے سننے والوں میں سے ایک کوئی بڑے بڑے لکھے پُرانے دھرانے بوزھے گھاگ یہہ کھتراگ لائے سر ہلا کر مونہہ بنا کر ناک بھوں چڑھا کر آنکھیں پھرا کر لکے کہئے ۔ یہہ بات ہوتی دکھائی نہیں دیتی ۔ ہندوی پن بھی نہ نکلے اور بھاکھا پن نہ کھوس جاے ۔ جیسے بھلے لوگ اچھوں سے اچھے آپسمیں بولتے چالتے ہیں جوں کا توں دھی دال رہے اور چہانہہ کسی کے نہ پڑے ۔ یہہ نہیں ہونے کا ! میں نے اونکی تہندی سانس کی پھانس کا تھوکا کھا کر جھنجلا کر کہا میں کچھ ایسا انوکا بولا

### *The beginning of a wondrous Tale.*

One day while I was sitting doing nothing, it came into my head to write a story in which the Hindoowy dialect should be preserved in its purity free from any admixture. Having taken this resolution, my heart expanded like a rose bud. Of course, no foreign words or barbarous expressions were to appear in it. Of those who heard my intention, one, a great wiseacre, an old curmudgeon, quarrelsome withal, and possessed of stentorian lungs, was determined to oppose the plan and introduced his nonsense by making faces, shaking his head, turning up his nose, lifting his eyebrows and turning away his eyes. He said, "It does not appear how this can be; that the Hindoowy quality of the style should not appear and the Bhakha not slip in: that the style common amongst the first sort of people, the super-excellent, should remain as it always was, and that neither of these should be reflected in it. This is impossible."

The difficulties he made were an offence to me, and I became angry, and said: "What I said was not so wonderful as to make a grain of



نہیں ! جو رائی کو پرست کر دکھاؤں اور جھوٹ سیج بول کے اونگلیاں  
نچاؤں اور بے سُرِی بے تہکانیکی اولجہی سلجہی باتیں سجاؤں • جو  
مجھ سے نہ ہو سکتا ! تو بہلا یہہ بات مونہہ سے کہوں نکالتا ؟ جس دھب  
سے ہوتا اس بکھیرے کو تالتا •

اس کہانی کا کہنے والا یہاں آپ کو جتاتا ہی ! اور جیسا کچھ  
لوگ اوسے پکارتے ہیں کہہ سناتا ہی • دھنا ہاتھ مونہہ پر پھیر کر  
آپ کو جتاتا ہوں ! جو میرے داتا نے چاہا تو وہ تارُ بھارُ اور آؤ  
جاؤ اور کود پھاند اور لپٹ چپٹ دکھاؤں جو دیکھتے ہی آپ کے  
دھیان کا گھوڑا ! جو بجلی سے بھی بہت چنچل ! اچھلاہٹ میں ہر فنوں  
کے روپ میں ! اپنے چوکری بھول جائے •

گھوڑے پر اپنے چرہ کے آتا ہوں میں  
کرتب جو ہیں سو سب دکھاتا ہوں میں •  
اوس چاہنے والے نے جو چاہا تو ابھی  
کہتا جو کچھ ہوں کر دیکھاتا ہوں میں \*

mustard seed appear a mountain, and mixing truth with falsehood to be obliged to convince and persuade my hearer by the aid of pantomime, and construct entangled and unconnected sentences without measure or moderation. How should my lips make the promise of a thing which I am unable to perform? In what way soever it is effected an end is put to this dispute."

The narrator of this story here declares himself, and to that degree in which some people proclaim him in the way of praise, speaks conformably. Passing the right hand over the face in consideration, I explain myself. Whatever my Benefactor willed, I shall essay, and leaping, jumping, running, striving, will shew my skill. Seeing which, the steed of your fancy, which is faster than lightning even, and in his bound like the deer, will be lost in amazement!

Mounting my horse, I come,  
The skill I have, I shew it all.



اب آپ کان رکھہ کے سنمکھہ ہوئے تک ادھر دیکھئے کس دھب سے  
بڑہ چلتا ہوں اور اپنے ان پھول کی پنکھڑی جیسے ہوتھوں سے  
کس روپ کے پھول اوگلتا ہوں •

## کہانی کا اوبھار اور بول چال کی دواہن کا سنگار

کسی دیس میں کسی راجہ کے گھر ایک بیٹا تھا • اسے اس کے ما باپ  
اور سب کے گھر کے لوگ کنور اودی-بھان کر کے پکارتے تھے • سچ میچ  
اس کے جوہن کی جوت میں سورج کی ایک سوت آ ملی تھی •  
اس کا اچھا-پن اور بھلا-لگنا کچھ ایسا تھا جو کسی کے لکھنے اور  
کھنے میں آ سکے • پندرہ برس بھر کے سولہویں میں پانو رکھا تھا • کچھ  
یونہی سی اوسکی مسیں بھیگتی چلی تھیں • آکر مکر اوس میں  
بہت سے سما رہی • تھی کسی کو کچھ نہ سمجھتا تھا • پر کسی بات  
کے سوچ کا گھر گھات پایا تھا • اور چاو کی ندی کا پات اون نے  
دیکھا نہ تھا • ایک دن ہریالی دیکھنے کو اپنے گھوڑے پر چڑھ کے  
اٹھیل-پنے اور لڑک-پن کے ساتھ دیکھتا بھالتا چلا جاتا تھا • اتنے میں

Do you turn your ear to me and giving me a little of your attention,  
see what a display I make, and what sort of flowers I disclose from  
the petals of my lips.

### *The Development of the Tale, and Embellishment of the Diction.*

In a certain country in the house of a Rájá was a son. Him his  
father and mother and all the people called Kunwár Ude-bhán. Truly,  
in the splendour of his beauty, a beam of the sun had been blended.  
His goodness and worth were such as cannot be described by tongue  
or pen. Being between his fifteenth and sixteenth years the down on  
his cheek began to sprout. He began to strut and give himself airs,  
and pay no respect to any one. Further, serious consideration on any



ایک ہرنی جو اوسکے سامنے آئی، تو اوسکا جی لوٹ پوٹ ہوا۔  
 اوس ہرنی کی پیچھے سب کوچہ و چہار کر گھوڑا پھینکا۔ کوئی گھوڑا  
 اوسکو پا سکتا تھا؟ جب سورج چھپ گیا اور ہرنی آنکھوں سے اوجھل  
 ہوئی، تب تو یہہ کنور اودی۔ بہان بہو کھا پیداسا اور اوداسا جامائیٹیاں  
 اور انگڑایاں لیتا ہکا بکا ہوئے لگا آسرا دھونڈھنے، اتنے میں کچھہ امرتیاں  
 دھیان چڑھیں۔ اودھر چل نکلا، تو کہا دیکھتا ہی؟ چالیس پچاس  
 رندیاں ایک سے ایک جوبن میں اگلی جھولا ڈالے ہوئے بڑی جھول  
 رہی ہیں اور ساون گائیاں ہیں۔ جو انہوں نے اُسکو دیکھا، تو کون؟  
 تو کون؟ کر چنگھار سی پرگئی۔ اون سبہونمیں سے ایک کے ساتھ اسکی  
 آنکھ لر گئی۔  
 دوا۔

کوئی کہتی تھی بہہ اچکا ہی کوئی تھی کہتی ایک پکا ہی۔  
 دھی جھولنی والی لال جوڑا پہنے ہوئے جسکو سب رانی کیتکی

subject found no entrance or abiding place in his mind and the breadth of the stream of friendship was not seen by him. One day having mounted his horse to see the country, he went away pranking, seeing, and looking about him, in company with other boys. His heart beat when he saw a deer before him. In pursuit of that deer he put his horse to a gallop, leaving them all behind. What horse could come up with him? When the sun set, and the deer was no longer to be seen, the Kunwár hungry, thirsty, yawning, gaping, distracted, began to seek some shelter. In the meanwhile some tamarind trees met his eyes. Having set off towards them, what a sight he saw! Forty or fifty girls, one more beautiful than another, playing at swings and singing *Sáwun*. When they saw him, "Who are you?" "Who are you?" they began to bawl out.

"A day-light thief he is," said one;

"A cunning fellow," quoth another.

Of that one, who was engaged at play and who wore a suit of red clothes, whom all called Rání Ketkí, the love of him made a resting



کہتے تھے اوسکے بیٹی جی میں اسکی چاہنے گھر کیا۔ پر کہنے سننے کو بہت سے ناہ نوہ کی اس لگ چلنے کو بہلا کہا کہتے ہیں؟ یک نہ یک جو تم جہت سے ٹپک پڑے۔ یہہ جانا جو یہاں رفتیاں اپنی جہول رہی ہیں۔ اجی تم جو اس روپ کے ساتھ بیدھڑک چلے آئے ہو۔ تہندی تہندی چہانہ چلے جار۔ تب انہوں نے سوس کے ملولا کہا کے کہا کہ اتنی رکھائیاں ندیجے۔ میں سارے دن کا تہکا ہوا ایک پیر کے چہانہ میں اوس کا بچاؤ کر کے پڑ رہوں گا۔ بڑی تر کے ڈھونڈ لے اوتہ کر جدھر کو مونہہ پڑیگا چلا جاؤں گا۔ کسی کا لیتا دیتا نہیں۔ ایک ہرن کے پیچھے سب لوگوں کو چھوڑ کر گھوڑا پھینکا تھا۔ جب تلک اوجالا رہا۔ اوسے کے دھیان میں تھا۔ جب اندھیرا چھا گیا اور جی بہت گھبرا گیا۔ ان امریوں کا آسرا ڈھونڈھ کر یہاں چلا آیا ہوں۔ کچھ روک ٹوک تو نہ تھی جو ماتھا تھنک جاتا اور رک رہتا۔ سر اوتہاے ہانپتا ہوا چلا آیا۔ کہا جانتا تھا پدمنیاں پڑی جہولتی پینگیں

place in the heart. But conversation she resolutely forbade, saying, "How can such an intercourse be called proper. When you dropped upon us all at once, you knew that some women were playing at their games. Now, Sir, do you, who have in this sort so boldly come hither, withdraw into some retirement." Then he, having felt the stroke of pain, said, "Do not look unkindly upon me. Wearied with the labours of the day, I will lie down, making the covering of a tree a defence against the dew; early in the morning before the mist has passed away, I will go in whatever direction my face may be turned. I have nothing to do with any one. Having, in pursuit of a deer, left all my people, I had set off at full speed. As long as there was light, I was intent on the chase. When darkness overspread the earth, and my mind was greatly bewildered, I came here seeking the shelter of these trees. There was no let or hinderance, that I should conceive an unfavourable issue, and pause. Without restraint, out of breath,



چڙها رهي هيس • پريون بدي تهي • برسوں ميں بهي جهولا ڪروں گا •  
 بهه بات سن ڪر جولال جوڙي - والي سب کي سردھري تهي اون نے  
 ڪها • هانجي بولياں ٿوليائون نمارو • انکو ڪهدو جهاں جي چاهي اپنے  
 پڙهيس • اور جو ڪچهه ڪها نے پينے کو مانگيس انھیں پهونچا دو • گهرائے کو  
 ڪسي نے آج تلڪ مار نهيس ڏالا • مونھه ڪا ڌول گال متمائے اور  
 هوتھه پيرائي اور گھوڙے ڪا هانپنا اور جي ڪا ڪانپنا اور گھبراھت اور  
 تھرتھراھت اور تھندي سانسيں بهرنا اور ندھال هوڪر گرے پڙنا انکو  
 سچا ڪرتا هي • بات بندي هوئي اُن - سچوئي کي کوئي چھپتي هي ؟  
 پرھمارے اور اونکے بيچ ميں ڪچهه اوت سي ڪڍرے لتے کي ڪردو • اتنا  
 آسرا پاڪ سب سے پرتے ڪونه ميں جو پانچ سات چھوڙے چھوڙے پودے  
 سے تے اونکے چھانھه ميں ڪنور اودي - بهان نے اپنا بچھونا ڪيا • سرھانے  
 هاتھه دھر ڪے چاھتا تھاسو رھ • پرنيندھ کوئي چاھت ڪے لگاوت ميں  
 آني تهي ؟ پڙا پڙا اپنے جي سے باتين ڪر رھا تھ • اتنے ميں ڪها هوتا هي ؟

I came hither. How did I know that these high-born damsels were swinging themselves? But it was thus predestined. For years will I stay here, and play at swinging."

Having heard these words, the wearer of the red suit, whom all the rest obeyed, said, "Pray, Sir, don't jest with us. Tell this man that he may lie down wherever he likes, and whatever meat, or drink he requires, furnish him with. No one has yet killed a guest. The look of him, his reddened cheeks, his parched lips, his panting horse, and his own confusion and trembling and deep sighs, with his falling down motionless, prove him to be sincere. Could any false pretence escape detection? But as some sort of screen between him and me, hang up some clothes." Having obtained so much protection, Ude-bhan made his bed in the most distant nook formed of five or six saplings. Having made his hand a pillow, he was wishing to go to sleep. But did ever sleep come in connexion with the wish felt? As he lay discours-



جورات سائیں سائیں بولنے لگتی ہی ! اور ساتھ والیاں سب سو سو رہتی  
 ہیں • رانی - کیتکی اپنی سہیلی مدن • بان کو جگا کریوں کہتی  
 ہی ! ارے آو توئے کچھ سنا ہی ؟ میرا جی اسپر آگیا اور کسی  
 دل سے نہیں تہم سکتا ! تو سب میرے بھیدونکو جانتی ہی ! اب جو  
 ہونے ہو سو ہو ! سر رہتا رہے یا جاتا جائے ! میں اوسکے پاس جاتی  
 ہوں • تو میرے ساتھ چلے پر تیرے پانو پڑتی ہوں کوئی سنے نہ پارے •  
 ارے یہہ میرا جوڑا میرے اور اوسکی بنائے والے نے ملا دیا • میں  
 اسی لٹیں ! جیسے ان امریوں میں آئی تھی • کیتکی مدن - بان کا  
 ہاتھ پکڑے وہاں آن پہونچتی ہی ! جہاں کنور اودے - بہان لیٹے ہوئے  
 کچھ سوچ میں پڑے پڑے ہزارے تھے • مدن - بان آگے بڑے کے  
 کہنے لگی ! تمہیں اکیلا جانکے رانی آپ آئی ہیں • کنور اودے - بہان یہہ  
 سنکے اوتھہ بیٹھے اور یہہ کہا ! کہ کہوں نہ ہو ؟ جی سے جی کو ملاپ ہی •  
 کنور اور رانی دونو چپ چاپ بیٹھے تھے • پر مدن - بان دونو کے بدن گد - گدا

ing with his own thoughts, what should happen but the night began to whisper and his companions all remained asleep.

Rání Ketkí, waking her maid Madanbán, thus spoke : " Do you hear ? come hither, and tell me if you have heard any thing. My heart is suddenly fixed on this man and cannot forbear. You know all my secrets ; now, happen what may, whether my head remain on my shoulders or not, I will go to him. Do you go with me, but I entreat of you to let no one know it. His Maker and mine have united him to me as a husband. I accepted him from the time we met in the tamarind grove."

Ketkí, taking the hand of Madanbán, went to the place where the Kunwár was lying down, thinking and talking to himself. Madanbán, going before her, began to speak, as follows : " Supposing you to be alone, the Rání has come herself." Ude-bhán hearing this, arose and sat up, saying : " Why not ? This is a meeting of hearts." The



رہی تھی • ہوتے ہوتے اپنی اپنی پتے سب نے کہوئی • رانی کا  
پتا یہہ کہلا • راجہ جگ پرکاش کی بیٹی ہیں • اور انکی ما رانی کام-لتھا  
کہلاتے ہیں • ایک مہینے پیچھے ما باپ نے انکے کہدیا ہی • امریوں میں  
جا کر جھول آیا کرو • اج دھی دن تھا سو تم سے مت-بہیر ہو گئے • بہت  
مہاراجوں کے کنوڑوں کی باتیں آئیاں پرکشی پرانکا دھیان نہ چڑھا • تمہارے  
دھن بھاگ ! جو تمہارے پاس سب سے چھپ کے میں جو انکی  
لڑکپن کی کوئیاں ہوں مجھے ساتھ اپنے لیکے آئیں ہیں • اپ-ہی تم  
کہانی کہو جو تم کس دیس کے کون ہو • انہوں نے کہا میرا باپ  
راجہ سورج-بھان اور مارانی لچھمی-پاس ہی • آپس میں جو کتھ  
جوڑا ہو جائے • تو انو-کھی اچرج اور اچنبہ کی بات نہیں • یو ہیں  
آگے سے ہوتا چلا آیا ہی • جیسے سامونہہ ویسی تہ پیرا • جوڑ توڑ تڈول لینے  
ہیں • دونو مہاراجوں کو یہہ چت چاہی بات اچھے لگے گی • پر ہم تم  
دونو کے جی کا کتھ جوڑا چاہے • اسمیں مدن-بان بول اوتھی • سو تو

Kunwár and the Rání both remained silent, but Madanbán amused them. By degrees, they all three disclosed their history.

The story of the Rání was as follows : " She is the daughter of Rájá Jagprokás and Rání Kámlathá. A month before, her father and mother said to her ' Go and divert yourself by swinging in the grove of tamarinds.' This day that she has become acquainted with you, the time is up. The addresses of many Rájahs' heirs have been tendered, but none of them have proved acceptable. What a destiny is yours ! That in the greatest secrecy she has come to see you, taking with her me, the familiar friend of her childhood. Do you now tell your history, what country you come from, and who you are."

He said, " My father is Rájá Surajbhán, and my mother Rání Latchmibás. Whatever alliance may be entered into by us will be no wonderful or extraordinary matter. It is in the usual course of things from time immemorial. It's as broad as it's long : are not



ہوا اپنی اپنی انگوٹیاں ہیر پھیر کر لو اور آپس میں لکھڑی ابھی  
 لکھڑو ۱ پھر کچھ ہچڑ مچڑ نہ رہی • کنور اودے۔ بہان نے اپنی انگوٹھی  
 رانی کیتکی کو پہنا دی اور رانی کیتکی نے انگوٹھی کنور کی انگلی  
 میں ڈال دی ۱ اور ایک دھیمی سی چٹکی بھی لے لی • اسمیں مدن۔ بان  
 بول اوتھی ۲ جو سچ پونچھو تو اتنی بھی بہت ہوئی اتنا بہر چلنا  
 اچھا نہیں میرے سر چوتھی • اب اوتھ چلو اور انکو سونے دو اور  
 روئیں ہرے روزی • وہ بات جب تھیلک تھاک ہو چکی تھی ۲ پچھلی  
 پھر سے رانی تو اپنی سہیلیوں کو لیکے جدھر سے آئی تھی اودھر چلی گئی •  
 اور کنور اودی بہان اپنے گھوڑے کی پیٹھ لگ کر لوگوں سے ملکر اپنے  
 گھر پہنچے • کنور جی کا روپ کبا کہوں کچھ کہنے میں نہیں آتا ۱ کہانا  
 نہ پینا نہ لگ چلنا کسی سے کچھ کہنا نہ سنا جس دھیان میں تھے  
 اوسی میں گوٹھے رہنا گھڑی گھڑی کچھ کچھ سوچ سوچ سر دھنا ۱  
 ہوتے ہوتے اس بات کا لوگوں میں چرچا پھیل گیا • کسی کسی نے

matches sought out ? The affair so much desired by the two Rájás  
 has befallen favourably. It was but the union of our hearts that was  
 wanting."

Madanbán then said : "The thing is done: make an exchange of  
 rings, and let there be a written contract between you : then no ground  
 for doubt will remain." The Kunwár put his ring on the finger of the  
 Rání, and she put hers on his, and gave him a little pinch. On this,  
 Madanbán interposed, saying. "Of a truth, this has gone too far : to  
 go so fast is not good : my life is in danger. You must now get up,  
 and leave this man to sleep, or if he like it, to weep." When the affair  
 was consummated, at the last watch of the night, the Rání taking her  
 attendants went to the place from which she came.

Kunwar Ude-bhan also mounting his horse and joining his retinue,  
 went home. How shall I describe the state of the Kunwar ? Words  
 are inadequate. He neither ate, nor drank ; he held intercourse with



مہاراج اور مہارانی سے کہا، کچھ دال میں کالا ہی، وہ کنور اودی بہان جن سے تمہارے گھر کا آؤ جالا ہی ان دنوں کچھ اوسکے بُرے تیور اور بیدول آنکھیں دکھائی دیتی ہیں، گھر سے باہر تو پانو نہیں دھرتا۔ گھر والیاں جو کسی دَول سے بہلاتی ہیں تو اور کچھ نہیں کرتا ایک اونچی سانس لیتا ہی۔ اور بہت کسی نے چہیزا تو چہیزا کہت پر جا کے اپنا مونہہ لپیٹ کے آتہ آتہ آنسو پڑا روتا ہی۔ یہہ سنتے ہی ماباب کنور کے پاس دورے آئے، گلے لگایا مونہہ چوما پانو پر بیٹے کے گر پڑے ہاتھ جوڑے اور کہا، جی کی بات ہی سو کہتے کہوں نہیں؟ کیا دُکھ پڑا، جو پڑے پڑے کراہتے ہو؟ راج پات جھکو چاھو دے دالو، کہو تم کیا چاہتے ہو، تمہارا جی کہوں نہیں لگتا؟ بہلا، وہ ہی کیا، جو ہونہیں سکتا؟ مونہہ سے بولو جی کہولو جو کہنے میں کچھ سوچکتے ہو ابھی لکھ بیجیو، جو کچھ لکھو گے جوں کی توں وہیں کر تمہیں دیجاوینگے، جو تم کہو کنویمیں گر پڑو

no one, he neither spoke nor listened, remained immersed in the subject of his thoughts, whatever that was. By degrees, reports of this began to spread among the people. One and another said to his father and mother: "There is some secret grief preying on his mind. That Udebhan, who is the light of your house, now knits his brows, and looks discomposed. He never sets his foot out of doors. If the females of the house try to divert him in any way, he does nothing but heave a deep sigh; and if any one tease him much, he goes within the curtains of his bed, hides his face, and sheds floods of tears." On hearing this, his father and mother came running up to him and embraced him, kissed him, fell at his feet, and besought him, saying, "What misfortune has befallen you, that you are always lying down and weeping? Give the royal dignity to whomsoever you please: only say, what you want. Why do you take no interest in any thing? What is there that cannot be effected? Speak out, open your heart to me:



تو ہم دونو ابھی گر-پڑتے ہیں • جو کہو سرکات - دالو تو ابھی سرکات - دالتے ہیں • کنوراودی بہان وہ جو بولتے - ہی نتیجے انہوں نے لکھ بیچنے کا آسرا پا کے اتنا بولے • ”اچھا اپ سدھارئے • ہاں میں لکھ بیچتا ہوں • پر میرے اوس لکھ بیچنے کو میرے مونہ پر کسی دھب سے نہ لانا • نہیں تو میں شرماؤں گا • اسی لئے مکھ - بات ہو کے میں کچھ نکھا • • اور یہ لکھ بیچا • ” اب جو میرا جی ناک میں آ گیا اور کسی دھب نہ رہا گیا اور آپ نے مجھے سو سو روپ سے کہولا اور بہت سا تٹولا • تب تو لاج چہوڑ کے ہاتھ جوڑ کے مونہ کو پہوڑ کے گگھیا کے یہ لکھتا ہوں • جگہ میں چاہ کے ہاتھوں کسی کو سکھ نہیں ہی • بہلا • وہ کون ہی جسکو دکھ نہیں • وہ اوس دن جو میں ہریالی دیکھنے کو گیا تھا • وہاں جو میرے سامنے ایک ہرنی گھوٹیاں اٹھائے ہوئے ہو-لی تھی • اوسکے پیچھے میں گھوڑا بگ چھت پہینکا • جب تک اوجالا رہا اوسیکے

what you hesitate to say, send to me in writing. Whatever you write shall be immediately fulfilled to the letter. If you say, 'Cast yourselves into a well,' we will both do so : if you say, 'Cut your head off,' we forthwith will do it." Ude-bhan, who hitherto spoke not at all, having the prospect of writing opened to him, said this much : " Good : be pleased to take your departure. I consent to your proposal of writing. But in no way speak before me of what I shall write about : else, I shall be ashamed. On this account I said nothing in your presence." He wrote as follows : " Now that my life is ready to depart, and as I must speak out, and that you have examined and proved me in a hundred ways, without shame, with reverence, without disguise, and with entreaty, sorrow and deprecation, I thus write. In this world, no one is secure from the attacks of love. Indeed, who is there without sorrow ? That day that I went to look at the verdure of the fields, when there a deer with ears erect held on before me, and I pursued



دُهن میں پینکا گیا • جب اندھیرا ہو گیا اور سورج دُوبا جی میرا  
 بہت اُداس ہوا • امریاں تاک کے میں اونمیں گیا • تو اُن امریوں کا  
 پتا پتا میرے جی کا گاہک ہوا • وہاں کا یہہ شغلا ہی کچھہ رندیاں  
 جہولا جہول رہیں تھیں • اُن سب کی سردہری کوئی رانی کیتکی  
 مہا راج جگت پرکاس کی بیٹی ہی اُنہوں نے یہہ انگوٹھی اپنی  
 مجھے دی اور میرے انگوٹھی اُنہوں نے لی • اور لکھاوت بھی لکھ  
 دی • سو یہہ انگوٹھی اُنکی لکھاوت سمیت میرے لکے ہوئی کے ساتھ  
 پہونچتی ہی • آپ دیکھ لیجئے • اور جسمیں بیٹے کا جی رہجائے وہ  
 کیجئے • مہاراج اور مہارانی اوس بیٹے کی لکے ہوئے آئی سے یوں  
 لکھتے ہیں • ہم دونوں نے اوس انگوٹھی اور لکھاوت کو اپنے انکھونسے  
 ملا • اب تم کچھہ کڑھو مت • رانی کیتکی کے ما باپ تمہاری بات  
 مانتے ہیں تو ہمارے سمدھی اور سمدھن ہیں دونوں راج ایلک جاگہ  
 ہو جائیں گے • اور جو کچھہ ناہ نوہ کی تھرے کی تو جس دُول سے

at full gallop. As long as there was light I continued the chase at full speed. When after the setting of the sun, darkness appeared, my heart was oppressed. Seeing some tamarind trees, I went under them. The leaves of those trees captivated my heart. The diversion going on there was that of swings, in which some females were engaged. The leader of them all was a certain Rání Ketki, the daughter of Maharája Jagprokás. She gave me this, her own ring, and took mine, and also entered into a contract in writing. Thus do this ring and her contract and mine come before you. Please to look at them, and do that by which your son's life may be preserved."

The Maharája and Rání upon the arrival of their son's letter, wrote as follows : " We have both, out of regard, rubbed that ring and that contract with our eyes. Grieve no more. If the parents of Rání Ketki listen to your suit, they will be our child's father and mother-in-law, and the two rules will become one. And if there should be



بن آویگا دھال تلوار کے بل تمہاری دولہن ہم تم سے ملا دینگے •  
 آج سے اوداس مت رہا کرو کہیلو کودو بولو چالو انفدیں کرو • اچھی  
 گھڑی سببہ مہورت سوچ کے تمہارے سسرال میں کسی بامہن کو  
 بھیجتے ہیں جو بات چیت چاہے ٹھیک کرلاوے • بامہن جو سببہ  
 گھڑی دیکھ کر ہر برای سے گیا تھا اوس پر بڑی کڑی پڑی •  
 سنتے ہی رانی کیتکی کے باپ نے کہا اونکے ہمارے ناتا نہیں ہونے کا  
 اونکے باپ دادے ہمارے باپ دادوں کے آگے سدا ہاتھ جوڑ کے باتیں  
 کرتے تھے اور جو ٹک تیوری چڑھی دیکھتے تھے بہت ڈرتے تھے  
 کہا ہوا جواب وہ بڑے گئے اور اونچے پر چڑے گئے • جسکے ماتھے ہم بائیں  
 آنکھوٹے سے ٹیکا لگاویں وہ مہاراجونکا راجہ ہو جائے • کسکا مونہہ  
 جو یہ بات ہمارے مونہہ پر لائے • بامہن نے جل بھن کے کہا اگلے  
 بھی اسی بچار میں تھے اور بہری سبہا میں یہی کہتے تھے ہم میں  
 اونمیں کچھ کھونت کی میل تو نہیں ہی • پر کنور کی ہت سے

any denial, then as far as it can be effected by the force of our arms, we will bring you and your bride together. From this day, grieve no more, play, divert and enjoy yourself. Having considered the divisions of time that will be fortunate, we will send a bráhmán to the house of your father-in-law, who will no doubt bring the proposal to a successful issue.

A great difficulty befel the bráhmán who, having seen an auspicious hour, had gone thither in great haste. On hearing his business, the father of Ráni Ketki said : "There can be no alliance between them and us. His ancestors in presence of my own always spoke with hands joined in reverence ; if for an instant they saw a frown, they trembled. What if they have waxed great, and are exalted ? He to whose forehead, I apply the *tika* even with my left thumb, becomes a rájá of rájás. Who shall dare to make such a proposal to me ?"

The bráhmán highly incensed said he also thought of this, and



ڪجهه هماري نهين چلتي ! نهين تو ايسے اوجھي بات ڪب همارے  
 مونھ سے نڪلتي ؟ يھ سنڌي ھي مھاراج ڏے ٻامھن ڪے سر پر پھولون  
 ڪي چھري پھينڪ ماري اور ڪھا جو ٻامھن ڪے ھٿيا ڪا دھڙڪا نہوٽا  
 تو تجکو ابھي چڱي ميں دلوا ڏالتا اوسکو ليڄاؤ اور ايڪ اندھيري  
 کوٽھري ميں موند رکو . جو اس ٻامھن پر بيٺي سو سب ڪنور  
 اودي بهان ڪے ماٻاپ ڏے سنڌي ھي لڙن ڪي تھان اپڻے تھاتھہ باذدہ ڪر  
 دلبادل جيے گھر آتے ھيں چڙہ آيا . جب دونو مھاراجون ميں لڙائي  
 ھونے لڳي راني ڪيتڪي ساون بهادورن ڪے روپ سے روڙے لڳي اور  
 دونو ڪے جي پر يھ آ گئي ! يھ ڪيسي چاھت ھي جسميں لوھو  
 برسنے لڳا اور اچھي باتون ڪو جي ترسنے لڳا . ڪنور ڏے چپڪے سے يھ لکھہ  
 بيڄا ! ”اب ميرا ڪليجا ٽڪرے ٽڪرے ھو جاتا ھي دونو مھاراجون کو  
 آپسميں لڙنے دو . ڪسي ڏول سے جو ھو سڳے تو تم مجھے اپڻے پاس  
 بلا لو . ھم تم دونو ملڪے ڪسي اور ڏيس کو نڪل چليں جو ھونے ھو

said in a large assembly, “In me and in him there is, I may say, no alloy, subtracting from perfect purity ; but I cannot prevail over the waywardness of the Kunwar. Otherwise, so mean a proposal would never have proceeded from me.” On hearing this, the Mahárájá threw his staff adorned with flowers on the head of the bráhman, and said, “If I were not afraid of the consequences of the murder of a bráhman, I would forthwith put you under a millstone. Take him away and confine him in a dark cell.” On hearing of all that had befallen the bráhman, the parents of Udebhan resolved on war, and his father equipping himself advanced like a gathering of clouds.

When the war between the two Rájás commenced, Ráni Ketki began to weep like the rains of July and August, and the same thought entered the minds of both : “What an attachment this is, that causes the shedding of blood, and the heart to long for good tidings, and to long in vain.”



سو هو • ايلڪ مالن جسڪو پهول ڪلي ڪر پڪارتے تے اون نے اوس  
 ڪنور کي چڻهي ڪسي پهول کي پنڪهري ميں لڀيت سپيت ڪ راني  
 ڪيتڪي تڪ پهونچا دي • راني نے اوس چڻهي سے آنڪهين اپني  
 صليں اور مالن کو ايلڪ تهال بهر ڪے موتي دئے اور چڻهي کي پيت پر  
 اپنے مونہہ کي بيڪسے بهه لکها ” اى ميرے جي ڪے گاهڪ جو تو  
 مجھے بوڻي بوڻي ڪر چيل ڪوے ڪو دے دالے تو بهي ميري آنڪهين  
 چين اور ڪليجه سڪهه هورے | پر بهه بات بهه ڪ چلنے کي اچهي  
 نهين • دل سے بيتا بيتي ڪے باهر هي | جي تجھسے پيارا نهين  
 ايلڪ تو ڪيا جو ڪرور جي جاتے رهين پر بهه ڪنے کي ڪوئي بات  
 همين تو اچهي نهين • بهه چڻهي بيڪ بهرے جو ڪنور تڪ جا  
 پهنجتي هي وه ڪئي ايلڪ سونے ڪے هيرے موتي پڪهراج ڪے  
 ڪچا ڪهچ بهري هوئي تهال نچهار ڪر ڪے لڏا ديتا هي اور چڻهي سے  
 اوسکي بيڪلي چوگنے پچگنے هو جاتي هي • اوس چڻهي ڪر اپنے  
 گورے دڏ پر باند ليتا هي •

The Kunwar secretly despatched the following letter : “My heart is now breaking. Let the Rájás fight against one another. Do you, by whatever means it can be effected, call me to your side. United, we will go to some other country. What is to happen, let it happen.” A máli's wife, who was called Phúlkali, took the Kunwar's letter, concealed in the leaves of a flower, to the Ráni. Ketki rubbed her eyes with that letter and gave her a large dish filled with pearls. Upon the back of the letter, she wrote in the juice of the betel, “O Master of my heart! If you cut me in pieces and throw my flesh to the kites and crows, even then there will be ease in my eyes and gladness in my heart. But this flight, which you speak of, is not good. It would be contrary to the duties of son and daughter. I love you better than life. Of what consequence is one life, if a myriad of lives be lost? But to fly would in my eyes be unseemly.”



انا جو گئی مہندر گر کا کیلاس پہاڑ سے اور ہرن ہرنی کردالنا  
کنور اودی بہان اور اسکی ما باپ کا \*

جگت پرکاس اپنے گرو کو جو کیلاس پہاڑ پر رہتا تھا یوں لکھ  
بیججتا ہی کچھ ہماری سہاکی کیجئے ! مہاکٹھن ہم بیتا ماروں کو  
پڑی ہی • راجہ سورج بہان کو اب یہاں تک بار بھک نے لیا ہی  
جو انہوں نے ہم سے مہاراجون سے ناتے کا دال کیا ہی کیلاس پہاڑ  
اکدال چاندی کا ہی • اوس پر راجہ جگت پرکاس کا گرو مہندر گر  
جسکو اندر لوگ سب کہتے تھے دھیان گیانمیں کوئی نوے لاکھ  
اتیتوں کے ساتھ تھاکر کے بیجی میں دن رات رھا کرتا • سونا روپا تانبے  
رانگے کا بناتا اور گٹکا مونہہ میں لیکے آرتا • ورے رہے اوس کو اور  
باتیں اس اس دھب کی دھیانمیں تھیں جو کچھ کہنے اور سننے سے  
باہر ہیں • مینہ سونے روپے کا برسا دیتا اور جس روپ میں چاہتا

When the Kunwar received this letter written in betel-juice, he made a sacrifice of a gold dish filled with abundance of pearls, diamonds and topazes, and left it at discretion. But his uneasiness increased with this letter four and five fold. The letter itself, he bound on his fair arm.

*The coming of Jogi Mohandar Gar from Mount Kailás, and his turning into deer Udebhan and his father and mother.*

Jaggat Prokás thus wrote to his Gurú who lived on Mount Kailás :  
" Be pleased to help me. A great hardship has befallen my unfortunate self. Such conceit has taken possession of Rájah Surajbhán that he has planned an alliance with my royal family."

Mount Kailás is entirely composed of silver. On it, Rájah Juggat Prokás's Gurú, Mohandar Gar, whom all call Indar, in reflection and contemplation, with some ninety lakhs of pilgrims spent the day and



ہو جاتا سب کچھ اوسکے اگے ایک کھیل تھا اور گانے میں اور بین بجانے  
 میں مہادیوجی چہت سب اوسکے اگے کان پکڑتے تھے • سُر سی جسکو  
 پندو کہتے ہیں ان نے بھی اسی سے کچھ کچھ گنگنا سیکھا تھا •  
 اوسکے سامنے چہہ راگ چہتیس راگنیاں آتھ پہر روپ مدھوں کا سا  
 دھرے ہوئے اوسکے سیوا میں ہاتھ جوڑے کھڑے رھتے تھے وہاں  
 اتیتوں کو یہ کہہ پکارتے تھے بھیرونگر بہدھاس گر ہند ولگر میکہ ناتھ  
 کدار ناتھ دیپک داس جوتی سروپ داس سارنگ روپ اور  
 اتیتیاں اس دھب سے کہلاتی تھیں گوجری اسوری گوری مالسری  
 بلال • جب چاہتا تھا ادھر میں سنکاس پر بیٹھ آواز پھرتا تھا  
 اور نوے لاکھ اتیت گئے اپنے اپنے مونہ لے ہوئے گیروئے بسترے پھنے  
 جتا بکھیر اوسکے ساتھ ہوتے تھے • جسکیری راجہ جگت پرکاس کی  
 چہتی ایک بھگولے پہنچتا ہی جوگی مندرگر ایک چنکھار مارکر

night in the worship of his God. Silver and gold he made out of tin  
 and copper, and on putting a certain concocted ball into his mouth  
 was able to fly in the air. If you have patience, I will tell of other  
 things relating to him, which are beyond comprehension. He could  
 rain down gold and silver, and transform every object as he wished.  
 Before him every thing was as play ; and in performing on the pipe  
 and in singing, all, save Mahádeo, confessed their inferiority to him.  
 Sursi also whom they call Pandoo, had learned the notes from him.  
 In his presence, the six Modes and their thirty-six wives assuming the  
 appearance of slaves, stood reverentially day and night. The names  
 of the Atyts or disciples were Bhyrongar, Bhibhasgar, Hindolgar,  
 Mekhnáth, Kedárnáth, Dipak Dás, Joti Sarup Dás, Sárung Rúp ;  
 and the female disciples were named after this fashion ; Gújrí, Asá-  
 wari, Gauri, Málszé, Biláwal. When he chose, he was wafted in the  
 space between heaven and earth, seated on his throne, and ninety  
 lakhs of the fakeers, who were his disciples, each putting a prepared



دل بادلوں کو تہلکا دیتا ہی • پکھنیر رتھ بہت اپنے مونہہ کو مل کچھہ  
کچھہ پڑھنت کرتا ہوا بارے گھوڑے کی پیت پر لاگا • اور سب اتیت  
مرگ چہالوں پر بیٹے ہوئے گئے مونہہ میں لٹے ہوئے بول اوتے گورکھہ  
جاگا • ایک آنکھہ کی جھپک میں وہاں آن پہنچتا ہی جہاں  
دونو مہاراجوں میں لڑائی ہو رہی تھی • پہلے تو ایک کالی آندھی  
آئی پھر اولے برسے پھر اک آندھی آئی کسیکو اپنی سدہ نہر ہی ہاتھی  
گھوڑے اور جتنے لوگ اور بھیڑ بہار راجہ سورج بہان کی تھی کچھہ  
نہ سمجھا گیا کدھر گئے اونہیں کون اُٹھا لیگیا • اور راجہ جگت پرکاس  
کے لوگوں پر اور رانی کیتکی جی کے لوگوں پر کیوڑے کی بوندوں  
کی ننھی ننھی پھار سی پڑنے لگی • جب یہ سب کچھہ ہو چکا  
تو گرو نے اپنے اتیتوں سے کہہ دیا اودی بہان سورج بہان لچھمی  
پاش ان تینوں کو ہرن ہرنی بنا کے کسی بن میں چھوڑ دو اور جو انکے  
ساتھی ہوں اون سبھوں کو توڑ پھوڑ دو • جیسا کچھہ گرجی نے کہا

ball in his mouth, wearing raiment of the colour of ochre, with matted dishevelled locks, accompanied him.

When the letter of Rájah Jaggat Prokás was delivered by the hands of a flying messenger, Jogi Mohandar Gar raised a scream, which made his army tremble.

Having smeared his face with the ashes of cow-dung and muttered a spell, he mounted a horse of the air. And all his disciples being seated on the skins of antelopes, and having taken the charmed balls in their mouths, awoke Gúrah by their shouting. In the twinkling of an eye, they arrived at the place where the two Rájahs were contending.

First, there came a dark storm, then a fall of hail, then again, a dark storm, so that no one retained his consciousness. As to the elephants, the horses, the people, the armament, which were of Rájah Surajbhán, it was not understood where they had gone, or who had



چہت پت روہیں کیا \* بپت کا مارا کنور اودی بہان جی اور اوسکا  
 باپ مہاراجہ سورج بہان جی اور اسکی ما مہارانی لچہمی پاس ہرن  
 ہرنی بن بن کے ہری ہری گہاں کئی برس تک چگتے رہے \* اور  
 اوس بہیز بہر کے کا کچہہ تہل بیرا نملا جو کدھر گئے اور کہاں \* یہاں رہنے دو

carried them off. But upon the people of Rájah Jaggat Prokás and of Ráni Ketki it rained perfume in fine drops.

When all this was over, the Gurú said to his disciples, "Change these three, Udebhán, Surajbhán and Lutchmibás into deer, and let them loose in some forest; their companions, tear in pieces. As the Gurú said, it was forthwith done. The Kunwar and his father and mother, having become deer, remained picking up the greenest grass for many years. And of their armament no abiding place, or hope remained; no account of where they had gone, or where they were staying.

Here let this part of the narration be suspended awhile.

(To be continued.)



No.	Genus.	Species.	Native Names.	Remarks.
<b>RANUNCULACEÆ.</b>				
1	Ranunculus.	Sceleratus.	..	Abundant in streams, &c.
2	Delphinium.	Ajasis.	..	Gardens.
<b>ANNONACEÆ.</b>				
3	Annona.	Squamosa.	Sitaphal.	Gardens bearing very good fruit, apparently wild on the hills of Kallinjur and Murfa in parts, but not generally in the jungle.
<b>MAGNOLIACEÆ.</b>				
4	Michelia.	Champaca.	Champa.	Introduced.
<b>MENISPERMACEÆ.</b>				
5	Cocculus.	Villosus.	..	Very abundant.
	..	Cordifolius.	Guncha.	Rocks in Kaliangurh Pergunna, sending down immensely long roots from above.
		Convolvulaceus.	..	Not common.
<b>Cissampilos.</b>				
<b>NYMPHÆACEÆ.</b>				
	Nymphæa.	Pubescens.	..	Rare.
	Nelumbium.	Speciosum.	..	Abundant.
<b>PAPAVERACEÆ.</b>				
10	Argemone.	Mexicana.	Lí.	Cultivated.
	Papaver.	Album.	Post.	Corn fields.
	Fumaria.	Parviflora.	..	Mud of rivers, &c.
		Crucifera.	..	Cultivated.
		Alyssoides.	..	
	Cochlearia.	Sativum.	..	
	Lepidium.			



15	Eruca.	Sativa.	Láhi.	Cultivated.
	Brassica.	Oleracea.	Kobí.	Ditto.
	Sinapis.	Dichotoma?	Sarsou.	Ditto.
	..	Glaucá?	Túria.	Ditto.
	..	Ramosa.	Rái.	Ditto.
20	Raphanus.	Sativus.	Múli.	Ditto.
	CAPPARIDÆ.			
	Streptocarpus.	Oblongifolia.	..	Rocky hills.
	Cratæva.	Roxburghii.	..	Jungles.
	Capparis.	Sepiaria.	..	Rarish—Rasin hill.
	..	Horrida.	..	Rare—near Chitarkot.
25	..	Aphylla.	..	Rare—on banks of Kén and Jumna.
	Polanisia.	Viscosa.	..	Fields, abundant.
	..	Chelidonii.	..	Marshes.
	Gynandropsis.	Pentaphylla.	..	Abundant.
	FLACOURTIACEÆ.			
	Flacourtia.	Ramoutchi.	..	Rocky hills.
30	VIOLARIÆ.			
	Jonidium.	Enneaspermum.	..	Abundant.
	POLYGALACEÆ.			
	Polygala.	Serpyllifolia.	..	Abundant.
	..	Rothiana.	..	Ditto.
	ELATINACEÆ.			
	Elatine (Bergia.)	Ammannioides.	..	Wet places.
	CARYOPHYLLÆÆ.			
	Mollugo.	Stricta.	..	Rocky hills.
	Polycarpæa.	Corymbosa.	..	Fields common.
35	Hapalosia.	Læefingii.	..	Banks of Ken.
	LINEÆ.			



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
	Linum.	Usitatissimum.	Bijri.	Cultivated.
	MALVACEÆ.			
	Malva.	Borbonica.	..	A garden at Banda.
	Althæa.	Ludwigii.	..	Dry ponds. This is my Malva Malvensis J. A. S. 1838.
	Sida.	Alba.	..	Common.
40	..	Alnifolia.	..	Ditto.
		Cordifolia.	..	Ditto.
		Humilis.	..	Ditto.
	Abubilon.	Indicum.	..	Ditto.
		Asiaticum.	..	Ditto.
45	..	Ramosum.	..	Garden.
		Polyandrum.	..	Abharkan P. Kaliangurh rocks.
	Lagunæa.	Lobata.	..	Rocky hills.
	Hibiscus.	Rosa sinensis.	..	Gardens.
		Panduriformis.	..	Corn fields.
50	..	Cannabinus.	Sani.	Cultivated.
		Vitifolius.	..	Hills.
		Truncatus.	..	Ditto.
54	..	N. S. ?	..	Differs from vitifolius in having cuspidate cap-sules.
	Serræa ?	Ditto.	..	Sihanda rocks, rare. Mánjávén—flowers not seen.
55	Bombicella.	Hirta.	..	With white var. granite hills.
		Parviflora.	..	Ibid.



Abelmoschus.	Esulentus.	..	Cultivated.
60 Pavonia.	Ficulneus.	..	Not uncommon.
Gossypium.	Cancellatus.	..	Rocks.
BOMBACEÆ.	Odorata.	..	Not rare.
Bombax.	Herbaceum.	..	Cultivated.
Helicteres.	Heptaphylla.	..	Planted.
Sterculia.	Isora.	Bytneriaceæ.	Every hill.
	Urens.	Kullu.	Hills conspicuous with its white, generally leaf- less, branches.
65 Riedleia,	Corchorifolia.	..	Waste ground and fields.
Waltheria.	Indica.	..	Hill sides.
Pentapetis.	Phænicea.	..	Marshes.
TILIACEÆ.			
Corchorus.	Acutangularis.	..	Field.
	Trilocularis.	..	Ditto.
70	Ollitorius.	..	Ditto.
	Tridens.	..	Ditto.
	Capsularis.	..	Ditto.
	Fascicularis.	..	Edges of ponds, &c.
	Angulata.	..	Common.
	Rotundifolia.	..	Barren places.
	Polygama.	..	Rasawra jungle.
	Columnaris.	..	Karthal hill.
	Rothii, W. A.	..	Ibid—berries a very pleasant acid.
	Tiliæfolia.	..	Ibid.
	Asiatica.	..	Cultivated and wild in hills.
	Gossypium.	Gabdi.	Table-land hills.
Triumfetta.			
75			
Grewia.			
80			
CISTINEÆ. (?)			
Cochleospermum.			



*Catalogue of plants found in the Banda district, 1847—40.*

No.	Genus.	Species.	Native Names.	Remarks.
	AURANTIACEÆ.			
	Feronia.	Elephantum,	Kaith.	Planted and apparently wild.
	Egle.	Marmelos.	Bel.	Ditto ditto.
85	Citrus.	Medica.	..	Gardens.
	..	Decumana.	..	Ditto.
	..	Limetta.	..	Ditto.
	..	Bergamia.	..	Ditto.
	..	Aurantium.	..	Ditto.
90	MALPHIGIACEÆ.			
	Hiptage.	Madablota.	..	Ditto.
	Aspidopteris.	Nutans.	..	Jungles.
	SAPINDACEÆ.			
	Cardiospermum.	Helicacaburn.	..	Common.
	Sapindus.	Emarginatus.	Ritha.	Planted, rare.
	MELIACEÆ.			
	Melia.	Composita.	Bakain.	Very rare.
	Azidirachta.	Indica.	Nim.	Planted, and apparently wild, bird sown?
95	AMPELIDEÆ.			
	Vitis.	Erioclada.	..	Rocks.
	..	Indica.	..	Ditto.
	..	Carnosa.	..	Ditto and bushy places.
	OXALIDEÆ.			
	Oxalis.	Sensitiva.	..	Marshy soil.



100	Averrhoa.	Corniculata.	..	Abundant.
	BALSAMINEÆ.	Carambola.	..	Garden.
	Impatiens.	Hortensis.	..	Ditto.
	ZYGOPHYLLACEÆ.			
	Tribulus.	Lanuginosus.	Gukhrn.	Common
	Balanites.	Ægyptica.	Ingua.	Very abundant.
	XANTHOXYLACEÆ.			
	Ailanthus.	Excelsa.	..	Rare.
	CELASTRINEÆ.			
105	Celastrus.	Asiaticus.	..	On kankar soil.
	Elæodendron.	Roxburghii.	Mamri.	Kaliangurh jungles.
	RHAMNEÆ.			
	Zizyphus.	Hortensis.	Ber.	Cultivated.
	..	Jujuba.	..	Common.
	..	Nummularifolia.	..	Abundant.
	..	Amplia, W. A.	..	Common.
110	Vintilago.	Xylopyrum.	Gotáhar.	Hills.
	Mangifera.	Madraspatana.	Pitti.	Hills. Used as a cure for itch.
	Odina Wodier.	Indica.	Am.	Cultivated.
		Wodier.		"Patha" or highlands.
		Latifolia.	Chironji.	Ibid.
115	Buchanania.	Anacardium.	..	Ditto.
	Semicarpus.	Glabra.	..	Ditto.
	Boswellia.	Pinnata.	..	Planted at Banda—wild in Kaliangurh.
	Garuga.			
	MORINGACEÆ.			
	Moringa.	Pterygosperma.	Sabygina.	Cultivated.
	LEGUMINOSÆ.			
120	Heylandia.	Latebrosa.	..	Rare.



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
	Crotalaria.	Mysorensis.	..	Rocks.
	..	Juncea.	..	Cultivated.
	..	Retusa.	..	Rocky banks of Ken : not common.
	..	Sericea.	..	Gardens.
125	..	Hirsuta.	..	Granite rocks (Patraha.)
	..	Luxurians.	..	Abundant, a favorite food of camels.
	Rothia.	Trifoliata.	..	Kumvára fields near Banda.
	Psoralea.	Corylifolia.	..	Black soil, common.
	Medicago.	Lupulina.	..	Bed of Ken—Ramgurh.
130	..	Denticulata.	..	Ibid.
	Melilotus.	Leucanthus.	..	Ditto.
	Trigonella.	Incisa.	..	Ditto.
	..	Fœnumgræcum.	..	Cultivated.
	Clitoria.	Ternatea.	..	Gardens.
135	Indigofera.	Linifolia.	..	Abundant.
	..	Cordifolia.	..	Ditto.
	..	Enneahpylla.	..	Ditto.
	..	Glandulosa.	..	Black soil—corn field.
	..	Cærulea.	..	Baragurh ruins.
140	..	Tinctoria.	..	Cultivated.
	..	Paucifolia.	..	Black soil.
	..	Trita.	..	Common—among rocks.



[illegible]



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
175	Cicer.	Pupicola, N. S.	..	Rocks—Sainpur.
		Hamosus, N. S.	..	Kallinjer.
	Ervum.	Arietinum.	Rahela.	Cultivated.
		Lens.	Masúr.	Ditto.
		Hirsutum.	Masuri.	Corn field.
180	Lathyrus.	Sativus.	..	Cultivated.
		Acutangulus.	..	Sandy corn field.
	Pisum.	Aphaca.	..	Moist land.
		Sativum.	..	Cultivated.
	Vicia.	Angustifolia.	..	Moist grassy places—banks of streams.
185	Dalbergia.	Sissu.	Shisham.	Planted. Common.
		Robusta? An.	..	Raipurwa, P. Firdhan.
	..	Paniculata?	..	..
		N. S.?	..	..
	..	Ditto.	..	Rusoun.
		Volubilis.	..	Kaliangurh.
	..	Dujeinensis.	..	Bargarh—scandent.
		Glabra.	Sánan.	Patha hills abundant—named on authority of Saharunpoor Bot. garden.
	Pongamia	Frondosa.	..	Planted—rare.
	Butea.	Superba?	Chuleha.	Common.
190	Erythrina.	Stricta.	Bindrásan.	Bargarh jungles.
		Precatorius.	Harwa-Katwa.	Granite rocks—Karthal.
	Abrus.	..	..	Common.



Galactia.	Tenuiflora.	..	Bushy places.
Rhynchosia.	Medicaginea.	..	Common.
195 Cantharospermum.	Albicans.	..	Rocks.
Carpopogon.	Pruriens ?	Konch.	Rocks. Jharal.
..	Niveus ? an	Kamách.	Garden at Banda.
Phaseolus.	new Sp. (?)		
..	Vulgaris.	..	Gardens.
200	Roxburghii.	Urud.	Fields, cultivated.
..	Aconitifolius.	Moth.	Ditto.
..	Sp. ?	..	Rocks at Patraha.
..	Sp. ?	..	Ditto.
..	Trilobus.	Ch, hihin.	Black soil.
Lablab.	Vulgaris.	..	Gardens.
205 Dolichos.	Lubia.	Lúbia.	Fields.
..	Tomentosus.	Bar sem.	Bushy places.
Canavalia.	Gladiata.	Arhar.	..
Cajanus.	Flavus.	..	Much cultivated.
Flemingia.	Roxburghii.	..	Hedysarum bracteata of Roxb. Brisput Kund.
210 Mimosa.	Rubicaulis.	..	Not rare.
Desmanthus.	Triqueter.	Chhúi-múi.	Black soil.
Dichrostachys.	Cinerea.	..	..
Prosopis.	Spicigera.	..	Rare.
Inga.	Dulcis.	Dakhini Babul.	One tree, M. Durgapúr—P. Schonoden from
215 Vachellia.	Farnesiana.	Rám Babul.	Deccan seed.
Acacia.	Catechu.	Khyr ?	Gardens.
..	Catechuoides ?	..	Patha jungles, abundant.
..	Leucophleæa.	..	A single bush near Banda.
..	Arabica.	Babul.	Not common. Sweet-scented.
			Abundant.



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
220	Albizzia.	Speciosa.	Sirris.	Common.
	..	?	..	Lowri fort.
	..	?	..	Kartal hill.
	Poinciana.	Pulcherrima.	..	Gardens.
	Parkinsonia.	Aculeata.	..	Ditto.
225	Guilandina.	Bonduc.	Khatkaranja.	Ditto.
	Tamarindus.	Indica.	Imli.	Common—growing to a very large size.
	Cathartocarpus.	Fistula.	Amaltas.	Gardens—and wild in the Pátha.
	Cassia.	Tora.	..	Common waste ground—fallow, &c.
	..	Absus.	..	Rocky places.
230	..	Pumila.	..	Ibid.
	..	Sophera.	Kasaundi.	Rubble.
	Bauhinia.	Variegata.	Kachnár.	Gardens, &c.
	..	Parviflora.	Mahauli.	Patha abundant—Granite hills.
	..	Purpurea.	..	Gurampur.
	ROSACEÆ.			
235	Rosa.	Damascena.	Guláb.	Gardens.
	Potentilla.	Supina.	..	Moist ground.
	COMBUTACEÆ.			
	Combutum.	Nanum.	..	Patha.
	Terminalia.	Chebula.	Har.	Ibid.
	..	BelERICA.	Bahera.	Ib.—and groves.
240	Pentaptera.	Tomentosa.	Turêha.	Patha.



..	Arjuna.	Khawa.	Ibid—and water hills—rare in plains.
Anagripus.	Latifolius.	Khurdhawa.	Patha—rare in plains.
..	Nov. Sp. : pendula.	..	Granite rocks.
GRANATEÆ.	Granatum.	Anar.	Gardens.
Punica.	Exaltata.	..	Rare muddy banks of Ken.
ONAGRARIÆ.	Parviflora.	..	Ibid.
245 Jusisia.	Bispinosa.	Singhara.	Rare—Gurh pond.
Ludwigia.	Parviflora.	Shej.	Sandstone hills—granite, rarer.
Trapa.	Tomentosa.	Dhawa.	Abundant throughout.
LYTHRÆÆ.	Inermis.	Mehndi.	Gardens.
Lagerstræmia.	Indica.	..	Wet places.
Grislea.	Glauc.	..	Ditto.
250 Lawsonia.	Vesicatoria.	..	Ditto.
Aipannia.	Rotundifolia.	..	Banks of streams.
..	Tenuis.	..	Rocky streams—rare in clay.
Ameletia.	Decapetalum.	Akol.	Not rare.
255	..	..	..
ALANGIACEÆ.	Pyriferum.	Jáman.	Gardens.
Alangium.	Jambolana.	..	Not common.
MYRTACEÆ.	Angustifolium.	..	One tree, near Banda. Abundant in the Ken and other rivers.
Psidium.	Communis.	..	Gardens.
Eugenia.	Ericoides.	..	Ken river—Ramgarh.
260 Myrtus.	..	..	..
TAMARISCINÆÆ.	..	..	..
Trichaurus.	..	..	..



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
	CUCURBITACEÆ.			
	Trichosanthes.	Anguina.	..	Gardens.
	..	Palmata.	..	Rocks.
	..	Cucumorina.	..	Bushy places.
265	Momordica.	Charantia.	Karela.	Gardens.
	..	Diœca.	..	Bushy and rocky places.
	Coccinia.	Indica.	..	Hedges, &c.
	Luffa.	Acutangula.	..	Gardens.
	..	Pentandra.	..	Ib.
270	..	Bandaol.	..	Black soil.
	Cucumis.	Madraspatanus, Roxb.	..	Abundant.
	..	Utilissimus.	..	Gardens.
	..	Sativus.	Kakri.	Ditto.
	..	Melo.	Kira.	Ditto and of Ken.
275	..	Cetrullus.	Kharbuz.	Ib.
	..	Pseudo-colocynthis.	Tarbuz.	Sands of Jumna.
	Benincasa.	Cerifera.	Indrayan.	Cultivated.
	Bryonia.	Scabrella.	Gol kadu.	Most common.
	..	Laciniosa.	Bilári.	Bushy places.
280	..	Garcini.	..	Ib.—not common.
	Lagenaria.	Vulgaris.	Kadu.	Cultivated.
	PORTULACACEÆ.			
	Portulaca.	Meridiana.	..	Not uncommon.



Trianthema.	Oleracea.	..	Cultivated.
SAXIFRAGEÆ.	Pentandra.	..	Common.
285 Vahlia.	Viscosa.	..	Wet places—banks of Ken.
UMBELLIFERÆ.			
Cnidium.	Diffusum.	..	Rare (near Baberû.)
Apium.	Graveolens.	..	Gardens.
Petroselinum.	Sativum.	..	Ditto.
Daucus.	Carotta.	..	Ditto.
290 Anethum.	Sowa.	..	Ditto.
Ptychotis.	Ajwain.	..	Ditto.
Coriandrum.	Sativum.	..	Ditto.
LORANTHACEÆ.			
Loranthus.	Bicolor.	..	Patha.
Viscum.	Attenuatum.	..	On Ziziphus, Patha—(Gonda hill.)
RUBIACEÆ.			
295 Hephogyne.	Panifolia.	Khem.	Jungles—towards Patha.
Nauclea.	Cordifolia.	Haldu.	Ibid.
Randia.	Dumetorum.	Karhâr.	Common in jungles.
..	..	Labher.	Rare in open country—also at Lauri.
..	..	Birâr.	Jungle, Kaliangurh near Nihî.
300 Gardenia.	Latifolia.	Pâphar.	Patha.
Hedyotis.	Burmanniana.	Al.	Very abundant.
Morinda.	Citrifolia.		Cultivated.
Ixora.	Coccinea.		Gardens.
Spermaceæ.	Articulatus.		Common.
305 Borrera.	Lasiocarpa.		Rocks.
COMPOSITE			
NIACEÆ.			
VIMO-			



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
	Vimonia.	Cinerea.	..	Two Var.—very common.
	..	Abbreviata.	..	Water-fall at Abharkan.
	Vernonia.	Aspera.	..	Ditto at Gurh Rampur.
	Decaneurum.	Divergens.	..	Groves.
310	Elephantopus.	Scaber.	..	
	EUPATORIÆ.			
	Adenostemnea.	N. S. Angustifolia.	..	Gurh Rampur.
	ASTERÆ.			
	Erigeron.	Asteroides, Roxb.	..	Banda—see note.
	Sphæranthus.	Hirtus.	..	Banks of Ken.
	Cyathocline.	Lyrata.	..	Moist places, Ibid—on wet rocks Kallinger— Var. Fl. white.
				Ibid.
315	Grangea.	Ægyptiaca.	..	
	..	Madraspatana.	..	..
	Blumea.	Amplectens, DC?	..	Marshy soil.
	..	Aurita, DC?	..	Ibid.
	..	Bovina, Ham?	..	Ditto.
	..	Commersonii?	..	Moist ground—banks of Cane.
320	..	N. S.? Fontinalis.	..	Ibid.
	..	Senecioides.	..	Wet rocks (large)—small or dry rocks.
	..	Foliolosa?	..	Moist banks of Ken.
	Pulicaria.	Saxicola.	..	Dry rocks—Karthal.
	(2 N. S.)			Sands of Jumna.
325	Francuria.	Crispa.	Búrhná.	Rocks and dry ground.
	Vicoa.	Indica.	..	



Cæulia.	Axillaris.	Wet places.
Eclipta.	Prostrata.	Passim.
Blainvillia.	Latifolia.	Banda rocks.
330 Siegesbrekia.	Orientalis.	Ibid.
SCORECIONIDÆ.		
Xanthium.	Indicum.	Bed of Ken—Ramgarh.
Selerocarpus.	Africanus.	Rocks, Banda.
Bidens.	Wallichii.	Ibid.
Glossogyne.	Pinnatifida.	Dry ground.
335 Glossocardia.	Boswellia.	Ibid.
Taygites.	Patula.	Gardens passim.
	Erecta.	..
Chrysanthellum.	Indicum.	Not rare.
Artemisia.	Scoparia.	Waste ground and fallow.
340 Myriogyne.	Minuta.	Moist places.
Tilago.	Indica.	Not rare.
	Hardwarica.	Ditto.
Emilia.	Sonchifolia.	Ditto.
CYNARÆ.		
Echinops.	Echinata.	Kallinger and elsewhere.
345 Amberboa.	Indica.	Black soil.
Microloachus.	Divaricatus.	Passim.
Cirsium.	Wallichii.	Sandy fields near Ken.
CICHORACEÆ.		
Cichorum.	Endura.	Cultivated.
Lactuca.	Sativa. (?)	Ditto.
350	Altissima ? an nov. spec ?	Rocks and dry banks.
	Asplenifolius.	Passim.
Microtychus.		



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
	CAMPANULACEÆ.			
	Campanula.	Canā.	..	Rocks.
	Wahlenbergia.	Dehiscens.	..	Fields.
	PRIMULACEÆ.			
	Androsace.	Rotundifolia.	..	Corn fields.
355	MYRSINACEÆ.			
	Ardisia.	Humilis.	..	Banks of Baghin and Pysani.
	EBENACEÆ.			
	Diospyros.	Embryopteris.	Kusi.	Banghar table-land.
	..	Melanoxylon.	Makurtendee.	Dells in the cliff of sandstone.
	..		Tendú.	Abundant—table-land and sand below.
	SAPOTÆÆ.			
	Bassia.	Latifolia.	Mahwa.	Abundant, wild and cultivated.
360	Mimusops.	Elengi.	Mulsari.	Gardens.
	..	Indica, DC.	Khirmi.	Wild on rocks at all the waterfalls.
	JASMINEÆ.			
	Nyctanthes.	Arbor tristis.	Harsinghar or Saher-wa.	Cultivated and wild—abundant—some hills quite covered with it as at Pangra.
		Zambac.	Bel.	Gardens.
	Jasminum.	Angustifolium.	Inwari.	Ditto.
365	..	Odoratissimum.	..	Ditto.
	..	Grandiflorum.	Chambel.	Ditto.



Apocynae.	Corundas.	Karaunda.	Gardens.
Carissa.	Diffusa.	Ditto.	Wild, abundant.
Thwetia.	Nerifolia.	Chandni.	Gardens.
370 Tabernaemontana.	Coronaria.	..	Ditto.
Plumieria.	Acuminata.	..	Ditto.
Vinca.	Pusilla.	..	Corn fields.
Ichnocarpus.	Fruticosus.	..	Rocky jungles.
Vallieris.	Dichotoma.	..	Ditto.
375 Hollarhena.	Pubescens.	..	Ditto.
Wrightia.	Rothii.	Dhndhi.	Ditto.
Nerium.	Odorum.	Kamal.	Gardens—wild in rocky streams.
Asclepiadiæ.	Grandiflora.	..	Gardens.
Cryptostegia.	Extensa.	..	Near Gulrampur.
Hemidesmus?	Hamiltonii, W. A. or Madar-ák.	..	Abundant, hedges, &c.
380 Dæmia.	Procera, DC.	..	Abundant.
Calotropis.	Gigantea.	Gúrmár.	Gardens, rare.
..	Melicida.	..	Rocky hills, abundant.
Gymnema.	Pallida.	..	Ditto.
Pergularia.	? ?	..	Abundant—rocks Sf. and Gr.
c 385 Marsdenia.	Tinctoria.	..	Kartal hill.
..	Tenacissima.	..	Ditto.
Cyrtolapis.	Reticulata.	..	Banks of Cam—Loretha.
Leptodenia.	Ditto.	..	Reesawre jungle.
390 ? ?	Spartium.	..	Arid bank of Jumna.
Ceropegia.	Tuberosa.	Kaswattia.	Sf.—Kuliangarh jungles.
			Bushy places.



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No.	Genus.	Species.	Native Names.	Remarks.
	GENTIANEE.			
	Canscora.	Diffusa.	..	Kallinjier, &c.
	..	Decussata.	..	Ditto.
395	Slevogtia.	Hyssopifolia.	..	Not uncommon.
	Pladera.	Pusilla.	..	Rocks.
	Exaceum.	Sp. Sulcatum ?	..	Moist ground—Rasin, &c.
	Limnanthemum.	Kleinianum.	..	..
	BIGNONIACEÆ.			
	Pajanellia.	Multijuga.	..	Jungles.
400	Spathodea.	Sp.	..	Kuliangurh, &c. barren hills.
	Stereospermum.	Suaveolens.	..	Rare—(near C.)
	Tecoma.	Undulata.	..	P. Chibu—dwarfish.
	Millingtonia.	Hortensis.	..	Gardens.
	SESAMEÆ.			
	Martynia.	Biflora.	..	Run wild from gardens.
405	Sesamum.	Orientele.	Til.	Cultivated.
	Petalium.	Murex.	Gukhrú.	Gardens.
	CONVOLVULACEÆ.			
	Evolvulus.	Hirsutus.	..	Abundant.
	Convolvulus.	Pluricaulis.	..	Ditto.
	..	Turpethum.	..	Jungles.
	..	Tridentatus.	..	Rocky hills.
410	..	Arvensis.	..	Fields.



415	Ipomæa.	Pilosus.	..	Jungles.
..	..	Obscurus.	..	Hedges, &c.
..	..	Sessiliflora.	..	Corn fields.
..	..	Reptans.	..	Ponds, &c.
..	..	Renifolia.	..	Marshy ground (black soil.)
..	..	Sepiaria.	..	Hedges, &c.
..	..	Pestigridis.	..	Corn fields.
..	..	Pedata.	..	Gardens.
420	Pharbitis.	Nel.	..	Ditto.
..	..	Hispida.	..	Ditto.
..	Quamoclit.	Vulgaris.	..	Ditto.
..	..	Phoenicea.	..	Ditto.
425	Batatas.	Edulis.	..	Ditto.
..	..	Pentaphyllus.	..	Hedges, &c.
..	Anisea.	Calycina.	..	Near Banda.
..	Calonyction.	Muricapis.	..	Hedges.
..	Rivea.	Sp?	..	Near Lonthe.
..	..	Hypocraterimorpha.	..	Near Banda—rare.
430	Porana.	Paniculata.	..	Kuliangarh.
..	Cuscuta.	Reflexa.	..	Common, especially on Adhatoda.
..	CORDIEÆ.	..	..	..
..	Cordia.	Myxa.	Lasúra.	Gardens.
..	HELIOTROPIÆ.	..	..	..
..	Ehretia.	Lævis.	Tamboli.	Chibu-ravines.
..	Rhabdia.	Glabra.	..	Beds of rivers, &c. Ken.
435	Heliotropium.	Unifolium.	..	Common—barren ravines, &c.
..	..	Marifolium?	..	Near Budousa.
..	..	Supinum.	..	Black soil, common.
..	..	Coromandelianum?	..	Cultivated ground—very common.



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
440	BORAGIÆ.			
	Trichodesma.	Indicum.	..	Abundant.
	..	Zeylanicum.	..	Rocky hills.
	..	Hirsutum?	..	Karthal.
	..	Inæquale.	..	Banda.
445	Bothriospermum.	Tenellum.	..	Banks of Ken—Banda.
	HYDROLEACEÆ.			
	Hydrolea.	Zeylanica.	..	Wet places.
	SCROPHULARINÆÆ.			
	Celsia.	Coromandeliana.	..	Banks of Ken.
450	Linaria.	Ramosissima.	..	Rocks, &c.
	Sutera.	Glandulosa.	..	Black soil.
	Hemodia.	Viscosa.	..	Ditto.
	Lindenbergia.	Urticifolia.	..	Rocks.
	Herpestes.	Monnieri.	..	Banks of Ken.
	Hysanthes.	Parviflora.	..	Ib.
	Bonnaya.	Brachiata.	..	Shady places.
	Sopubia.	Delphinifolia.	..	Black soil.
	Striga.	Euphrasioides.	..	Corn fields.
	Bucknera.	Hispida.	..	Rocks.
455	Limnophila.	Roxburghii.	..	Rocky-pools.
	Buddleia.	Neemda.	..	Banks of streams.



OROBANCHEÆ, Philipæa.	Indica.	..	Corn fields.
SOLANÆÆ, Datura.	Metel.	Dhatúra.	Cultivated.
460 Physalis.	Somniferum.	..	Common rubble, &c.
..	Angulatum.	..	Rocks.
..	Peruvianum.	..	Gardens.
Capsicum.	Putescens.	Mirch.	Cultivated.
Solanum.	Melongena.	Bhánta.	Ditto.
465	Indicum.	..	Rocky ground.
..	Jacquini.	..	Passim.
..	Incertum.	Makó.	Fields, &c.
..	Verbascifolium.	..	Kuliangarh jungles, &c.
ACANTHACEÆ, Elytraria.	Cristata.	..	Gravelly soil, Banda.
470 Nelsonia.	Tomentosa.	..	Moist banks of nullahs.
Ebermaiera.	Pedicellata.	..	Lauri fort.
Hemiadelphis.	Polysperma.	..	Ditches.
Physichilus.	Serpyllum.	..	Banks of streams—especially rocky.
Petalidium.	Barlerioides.	..	Kallinger.
475 Dipteracanthus.	Prostratus.	..	Shady places.
..	Patulus.	..	Buragarh fort.
Hemigraphis.	Latebrosa.	..	Rocks.
Ruellia.	Hirta.	..	Dry waste ground.
Barleria.	Ciliata.	..	Rocky and raviny places.
480	Priotitis.	..	Rocks at Rasin, wild—gardens.
Asteracanthus.	Longifolius.	..	Ditches, &c.
Lepidagathis.	Ustulata.	..	Rocks.
..	Cristata.	..	Ravines, &c. passim.



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
485	Blepharis.	Molluginifolia.	..	Gravelly soil, Banda.
	..	Boerhaavifolia.	..	Rocks—very luxuriant.
	Phlogæanthus.	Thyrsiflorus.	..	Kuliangarh jungles.
	Rostellularia.	Rotundifolia.	..	Grass lands.
	..	Procumbens.	..	Rocky places.
	..	Peploides.	..	Fields.
490	..	Quinquangularis.	..	Ditto.
	Adhatoda.	Vasica.	..	Passim.
	Eranthemum.	Montanum.	..	Rocky hills.
	Rungia.	Repens.	..	Grassy places.
	..	Parviflora.	..	Rocks, &c. much larger than the usual form.
495	Pinstrophe.	Bicalyculata.	..	Passim, fields.
	Dicliptera.	Cardiocarpa.	..	Banks, &c.
	Andrographis.	Paniculata.	..	Rocky places.
	..	Abioides.	..	Ditto.
	VERBENACEÆ.			
	Lippia.	Nodiflora.	..	Moist ground—abundant.
500	Lantana.	Alba.	..	Ravines.
	Clerodendrum.	Phlomoides.	..	Ravines, &c.
	Gmelina.	Parvifolia.	..	Gardens.
	Vitex.	Bicolor.	..	Ravines, &c.
	LABIATÆ.			
	Ocimum.	Basilicum.	..	Gardens—3 varieties.





505	Orthosiphon. Anisochilus. Pogostemon. Colebrookea. Salvia.	Sanctum. Pallidus. Carnosus. Oppositifolia. Pumila. Plebeia.	.. .. .. .. .. ..	Cultivated. Waste ground—rare. Rocks. Gardens. Gurhampur—rocky glen. Sands of Jumna. Passim.
	Nepeta.	Ruderalis. Clinopodoides. Ovata. Nepetifolia. Urticifolia. Procumbens. Aspera. Mollissimum ?	.. .. .. .. .. .. .. .. ..	Banks of Ken. Kallinger—Mhow. Banks of Ken. Waste ground. Gardens. Rocky ground. Rocks, &c. Fields. Banda—rock.
515	Anisomeles. Leonotis. Leucas.	Zeylanica. Pongatium. MONOCHLAMYDEÆ. Pharnaceoides.	Chitáwar. .. .. ..	Common. Marshes. Sandy ground.
520	Plumbago. SPHENOCLEACEÆ. Sphenoclea.	Vulgaris. Orientalis. Album. Basellacea. Rubra.	Choukandar. Palak. .. Bi.	Gardens (European). Cultivated. Ditto. Cultivated
525	PlumbagineÆ. PhytolaccaceÆ. Gisekia. SalsolaceÆ. Beta. Chenopodium. Basella.			



*Catalogue of plants found in the Banda district, 1847—49.*

No.	Genus.	Species.	Native Names.	Remarks.
530	AMARANTACEÆ. Celosia.	Argentea.	..	Corn fields.
	..	Cristata.	Gul Makhmal.	Gardens.
	Amaranthus.	Mangostanus.	Chaulahi.	Ditto.
	..	Paniculatus.	Lal-ság.	Ditto.
	Erva.	Scandens.	..	Bushy places.
535	Achyranthus.	Aspera.	Chirchira.	Abundant—useful to cure scorpion stings.
	Digera.	Alvensis.	..	Fields, &c.
	Pupalia.	Lappacea.	..	Thickets.
	Gomphrena.	Globosa.	..	Gardens.
	Alternanthera.	Nodiflora.	..	Moist places.
540	..	Denticulata.	..	Moist shady places.
	NYCTAGINÆÆ. Boerhaavia.	Diffusa.	..	Abundant—waste ground.
	..	Repanda.	..	Thickets.
	Mirabilis.	Jalapa.	..	Gardens.
	ARISTOLOCHIACEÆ. Aristolochia.	Bracteata.	..	Banda or Khella.
545	POLYGONACEÆ. Polygonum.	Seet (Penicaria, Sp. nov ?)	..	Gurhampur.
	..	Seet amblygonum or tomentosum ?	..	Marshes.

(To be continued.)



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
530	AMARANTACEÆ. Celosia.	Argentea.	..	Corn fields.
	..	Cristata.	Gul Makhmal.	Gardens.
	Amaranthus.	Mangostanus.	Chaulahi.	Ditto.
	..	Paniculatus.	Lal-ság.	Ditto.
	Erva.	Scandens.	..	Bushy places.
535	Achyranthus.	Aspera.	Chirchira.	Abundant—useful to cure scorpion stings.
	Digera.	Alvensis.	..	Fields, &c.
	Pupalia.	Lappacea.	..	Thickets.
	Gomphrena.	Globosa.	..	Gardens.
	Alternanthera.	Nodiflora.	..	Moist places.
540	..	Denticulata.	..	Moist shady places.
	NYCTAGINÆÆ. Boerhaavia.	Diffusa.	..	Abundant—waste ground.
	..	Repanda.	..	Thickets.
	Mirabilis.	Jalapa.	..	Gardens.
	ARISTOLOCHIACEÆ. Aristolochia.	Bracteata.	..	Banda or Khella.
545	POLYGONACEÆ. Polygonum.	Seet (Penicaria, Sp. nov?)	..	Gurhampur.
	..	Seet amblygonum or tomentosum?	..	Marshes.

(To be continued.)



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
530	AMARANTACEÆ.	Argentea.	..	Corn fields.
	Celosia.	Cristata.	Gul Makhmal.	Gardens.
	..	Mangostanus.	Chaulahi.	Ditto.
	Amaranthus.	Paniculatus.	Lal-ság.	Ditto.
	..	Scandens.	..	Busby places.
535	Ærva.	Aspera.	Chirchira.	Abundant—useful to cure scorpion stings.
	Achyranthus.	Alvensis.	..	Fields, &c.
	Digera.	Lappacea.	..	Thickets.
	Pupalia.	Globosa.	..	Gardens.
	Gomphrena.	Nodiflora.	..	Moist places.
	Alternanthera.	Denticulata.	..	Moist shady places.
	..	..	..	..
540	NYCTAGINÆÆ.	Diffusa.	..	Abundant—waste ground.
	Boerhaavia.	Repanda.	..	Thickets.
	..	Jalapa.	..	Gardens.
	Mirabilis.	Bracteata.	..	Banda or Khella.
545	ARISTOLOCHIACEÆ.	..	..	..
	Aristolochia.	..	..	..
	POLYGONACEÆ.	Seet (Penicaria, Sp. nov.)	..	Gurhampur.
	Polygonum.	Seet amblygonum or tomentosum?	..	Marshes.

(To be continued.)



*Catalogue of plants found in the Banda district, 1847—49.*

No.	Genus.	Species.	Native Names.	Remarks.
530	AMARANTACEÆ.	Argentea.	..	Corn fields.
	Celosia.	Cristata.	Gul Makmal.	Gardens.
	..	Mangostanus.	Chaulahi.	Ditto.
	Amaranthus.	Paniculatus.	Lal-ság.	Ditto.
	..	Scandens.	..	Bushy places.
535	Ærva.	Aspera.	Chirchira.	Abundant—useful to cure scorpion stings.
	Achyranthus.	Alvensis.	..	Fields, &c.
	Digera.	Lappacea.	..	Thickets.
	Pupalia.	Globosa.	..	Gardens.
	Gomphrena.	Nodiflora.	..	Moist places.
	Alternanthera.	Denticulata.	..	Moist shady places.
	..	..	..	..
540	NYCTAGINÆÆ.	Diffusa.	..	Abundant—waste ground.
	Boerhaavia.	Repanda.	..	Thickets.
	..	Jalapa.	..	Gardens.
	Mirabilis.	Bracteata.	..	Banda or Khella.
545	ARISTOLOCHIACEÆ.	..	..	Gurhampur.
	Aristolochia.	Seet (Penicaria, Sp. nov.)	..	Marshes.
	POLYGONACEÆ.	Seet amblygonum or tomentosum?	..	..
(To be continued.)				



بحر فارس

المشرق



طهوا الف من السند

محمادی

قصیدان

سوره

کرم کا مان

فقد ایل

منه الى الله  
والله اعلم

١١١١

حسد مفارزه کرمان و سجنان

卷二

النهار



*Translation of Ibn Huokul's Account of Scind.*—By Major ANDERSON.

The work of Ibn Huokul is often mentioned as the ground work of all Arabian Geography,—but though found in many translations and transfusions, the entire book is hardly to be obtained.

The text is the basis of much to be traced in Edresee ; while under a Persian garb it is by many supposed to be identical with the Momalek wa Mosalek translated by Sir William Ousley.

Yet how few of the places mentioned in these books have been identified to the satisfaction of a single reader. I had often tried to arrive at some clear idea of the North West Provinces of India, as delineated in both Edresee and Sir Wm. Ousley,—but had given up the attempt as hopeless.

Hearing, by chance, my friend Dr. Sprenger had obtained a copy of this much desired book from Lucknow, I applied for the loan of it. This was kindly granted.

With the assistance of a Moonshee, and with no little trouble and labour, I contrived to knock out the sense of the chapter on Scind.

I selected this country as being a province now more known ; and as the only portion of India attempted to be described in any detail. I trusted to the prospects of some little assistance to be obtained from inhabitants of both Scind and Beloochistan, now residing in Calcutta.

The errors of the original are beyond all belief in the matter of proper names,—once having departed from the correct primitive form, I consider there to exist no reasonable form into which any given Arabic proper name may not be contorted under constant copying,—like two parallel lines once departing from their true conditions—the further carried the more they diverge.

I soon found, that the true key to much of this confusion was contained in the words of a most able Indian Numismatist, Mr. Thomas, of the Civil Service.

“Instead of endeavouring to identify Hindu names through the mazes of uncertainty of the Arabic manuscript, boldly to correct the Arabic from the unquestionable records of the coins themselves ; and instead of applying coins to Kings, apply Kings to their own coins.”

The map—distances and the rivers, afford landmarks which reduce the locality of any doubtful place within defined limits, and have enabled



me to offer a fair guess at some few of the towns and districts mentioned. No doubt many are questionable; but the errors may be cleared up by the researches now making in the very district. I shall be amply repaid if this sketch draws attention to the subject, and leads some antiquarian of young Egypt, to identify with certainty the locality of the once celebrated Munsooruh. When my share of the undertaking was complete, Dr. Sprenger obtained for me a copy of the fragment published by Gildemeister,—only in time to prove the lacunæ in the works I had translated.

Any attempt to combine the two originals would only have resulted in a new compilation—two or three passages alone were improved by use of the last work.

Possessing no knowledge of Arabic, more than sufficient with the help of Dictionary, Grammar and Moonshee, to reach the sense of a common passage; I leave the weight of the original entirely on my friend Dr. Sprenger than whom I know none better able to support the burden. He will also give the history of his own Manuscript, which he now questions being the original text of Ibn Huokul; but as such it was mentioned to me. In the usual Asiatic mode I add—which is truth, God knows.

The country of *Scind* with the adjoining districts I have placed in one Map,—viz. *Scind*, a portion of India, of *Mukran*, of *Zoran* and of the *Buroohee* country. To the east of all these, lies the Persian Gulf; to the west *Kerman*, the deserted and the cultivated parts of *Segistan*; to the north *India*; and to the south, the deserts between *Mukran* and *Khodzdar*; beyond these is the Gulf of Persia; which also encloses this country to the east. On the south beyond the desert, lies the great ocean, which extends from *Seemood* eastward unto *Teez* of *Mukran*; it winds round the desert and then inclines towards *Kerman* and *Persia*.

Of the cities belonging to this division are found the following:—of *Mukran*—*Teez*; *Punjgoor*; *Duzuk*; *Rasuk*, the town of the Separatists; *Bund*; *Kusurkund*; *Esfukuh*; *Kulpooruh*; *Mushkan*; *Pusunee*; *Gwadul*.

Of *Zoran*; *Bunjaruh*; *Shoorawukh*; *Khodzdar*.

Of the *Buroohee* district; *Gundava*.

Of *Scind*; *Munsooruh*, called *Mameewan* in *Scindee*; *Deebul*;



Beeroon ; Kuluree ; Unree ; Bulree ; Musoowahee ; Tuhruj ; Sameeyuh ; Haluree ; Shewan ; Roor.

Of *India* ; Kamahul ; Kumbayet ; Soobaruh ; Sondan ; Suemoor ; Moltan ; Chundurawur ; Besmed ; such are some of the towns of these countries, as I understand them.

From Cambay to Mysore is the dominion of a Maharajah, one of the kings of India, and is inhabited by infidels ; except those cities which are occupied by Mohamedans ; over these none are placed on the part of the Maharajah, except a follower of Eslam ; in them are Mosques, in which a congregation of the faithful openly takes place. In the capital of the Maharajah itself, the Azan is not permitted ; his country is most extensive.

**MUNSOORUH.**—This city is about a mile square and surrounded by a branch from the Indus which almost makes the place an island. The inhabitants are Mohamedans and their chief is said to be of the Koreesh tribe, descended from Hobbar, the son of Uswud, who with father and grandfather has governed the place. The Khotbuh is read in the name of the Caliph. The climate is extremely hot. The soil produces dates—but no grapes, no apples, no pears, no walnuts ; yet sugar-cane. In their orchards is a fruit of the size of an apple called *leemoonuh*, extremely acid. Also one called the mangoe, in taste and appearance not unlike the peach. The price of articles is low, the country fruitful.

The coins current are, the copper puesa,—crown pieces worth five derhems ; also a derhem called the Tartar, weighing one and two thirds of the standard derhem. Golden denars are also common. The dress of the people is similar to that of the inhabitants of Eerak ; except the style of their chiefs, which assimilates more to that of the kings of India, especially in the mode of wearing long hair and full dresses.

#### MOLTAN.

This town is about half the size of Munsooruh. It bears the name of the *City of Gladness* and *Capital of Gold*. A celebrated idol is contained within the place, which is worshipped by all India ; pilgrimages are undertaken to its shrine from all parts ; and much wealth is presented year by year to the temple and the sacred devotees. The name of the place *Moltan* is derived from a title of this idol. The



temple is a structure in the midst of buildings situated in the streets of Moltan near the bazar of the ivory workers on the side of the copper-smiths. In the centre of this structure stands a dome in which is placed this idol. Round the building are houses for the various servants of the temple, and of those devoted to religious austerities. This idol is alone worshipped in Moltan whether by people of India or of Scind; nobody lives in the building with the idol.

This image is in the similitude of a human being, seated upon an elevated platform built of brick and mortar. Sometimes the entire body is covered up, the outward skin is very red in colour, like mujeet. Nothing is left to be seen but the two eyes. Some people think the body of the idol is made of wood; but some consider it of other substance. They will not permit it to be exposed; its eyes are composed of two jewels and on its head is placed a crown of gold. Seated on the platform, its arms are extended to its knees with the fingers closed up as if counting four in number. The Umeer of Moltan takes all the wealth presented to the idol and expends it on the priests.

When the sacred war-banners of Eslam were first carried into India; this idol was thrown down, exposed, broken, and burnt; after which the warriors returned having destroyed the city. Near Moltan are many high-walled forts; the soil is very productive, but exceeded by Munsooruh in cultivation and in population. Moltan acquired the title of the City of Gladness and Capital of Gold, because it was one of the first places conquered to Eslam. At the time there was much distress and want in the Moslem army—but in the city was obtained large quantities of gold. The army was refreshed by the spoil. Outside Moltan at the distance of about a half a fursukh, is a collection of houses called Chundurawur, the cantonment of the Umeer; he only enters the city on Friday, when seated on an elephant he proceeds to the place of prayer.

The Umeer is of the Koreesh tribe, one of the sons of Samuh, the son of Lowa. He reigns over them, pays no obedience to the chief of Munsooruh, but reads the Khotbuh in the name of the Caliph.

BISMUD is a small place situated with Moltan and Chundurawur, on the east of the Indus, at a distance of one fursukh from the river. Their water is all drawn from wells; the soil is culturable.



**ROREE** is equal in size to Moltan ; it has a double wall ; being situated on the banks of the Mehran—near the confines of the district of Munsooruh.

**DUBEEL** is situated on the west of the Indus on the coast of the sea, is a grand mart and port of this and neighbouring countries. The cultivation is circumscribed ; affords no large trees nor dates ; indeed the soil is one of great aridity—still a place of trade.

**BEEROON** is a town located half way between Dubeel and Munsooruh rather nearer to the latter ; the traveller between these two places must cross the river Indus at **HALUREE** situated on the west bank.

**MUSOWAHEE TUHRUJ** and **SHEWAN** are all on the west side of the streams ; but **UNUREE** and **BULUREE** are both on the east side, rather distant from the banks, on the high road between Munsooruh and Moltan.

**KULUREE** is found to the west of the Indus, close to the branch which taking off from the main river, flows behind Munsooruh.

**SAMEYAH** is a small town in which resides Omur, son of Abd-ol-uzeez Hobaree of the Koreesh tribe ; his grandfather was a ruler of Munsooruh.

**KAMAHUL** is one of the first towns on the frontiers of India on the road to Mysore. From Kamahul to Mysore is Indian, but from the same place to Mukran, Burhooe and Moltan is Scindian.

**SCIND** is surrounded by infidel tribes, of whom the Burhooe is most celebrated.

This tribe is distributed over the country between Zoran, Mukran, Moltan and Munsooruh ; chiefly to the west of the river—the men are great breeders of camels, and export an animal of the class which is much sought after in Khorasan, Persia and other countries.

The central town of their trade is Gundava. The tribe is a wandering one, among the wilds and jungles.

The Jats are a tribe moving on the banks of the Indus from the confines of Moltan to the sea, chiefly on the deserts between the Indus and Kamahul residing on pasture lands and feeding grounds. A very numerous race.

**KAMUHUL**, **CAMBAY**, **SONDAN** and **MYSCORE** contain mosques, and the people openly follow the rites of Islam. They are fertile and large territories possessing groves of cocoanut trees, plantains and



mangoes. The chief portion of their cultivation is rice ; honey is plentiful, but dates do not thrive.

DAHOK and KOLWAN are large villages lying between Keej and Gwadul, Kolwan belongs to Mukran, but Dahook is a frontier town of Munsooruh ; the last is deficient in cultivation and unproductive, but rich in cattle.

ZOORAN is a valley containing a town of the same name, with a citadel in its centre.

Aboo Kasem of Busoruh is the Administrator of Civil Justice, the Collector, the Kaze, the Governor, and the Alms-giver—but he cannot distinguish between three and ten.

Khozdar is a district of towns and hamlets—the chief being one Mogheeruh, the son of Uhmud ; he reads the Khotbuh in the name of the Caliph, but pays no kheraj. He resides at a place called Kuekanan, productive and cheap, affording anabs, grapes and other fruits of the colder climates, but no dates.

The country is a flat desert between Kamahul and Sameyuh, as well as from the former to Cambay. Well inhabited Indian villages lie near each other on the road to Mysoor ; in them are to be seen both Mohamedans and Infidels alike in regard of their clothes and length of hair, the habiliments chiefly being trowsers or shalwars.

The heat of the climate is excessive.

The clothes of the inhabitants of Moltan are similar.

The people of Munsooruh and Moltan speak both Arabic and Scindee while the inhabitants of Mukran use both Persian and Mukranee. The usual dress is the long loose gown ; except traders who wear the long close fitting coat with the shawl and other articles of clothing prevailing in Persia and Erak.

MUKRAN is a broad extensive tract of country, where want, famine and indigence prevail. The ruler is one Jesus, the son of Madan, called in the language of the country, Muhya. His residence is Keez, a city about half the size of Moltan, abounding in dates. A port to Mukran and these parts—

Teez, known as Teez of Mukran, is the largest city of the country *Punjgoor, Geyuh, Bund, Kusur Kund, Duzuk, Kulphooruh* are all small places and very hot ; containing villages of the Separatists. Their chief place is Rasek and other hamlets of JUDRAN. This dis-



trict produces celebrated faneez with dates and sugar-cane; the faneez is exported to many parts—a portion also comes from Mukran and Khozdar. The inhabitants of all these places are of the class called Separatists.

There is situated on the confines of Kerman, a district called Mushkan; the chief being Mozzuher, the son of Rujuo; he does not read the Khotbuh in the name of the Caliph or acknowledge any of the neighbouring chiefs as his superior; this district extends three marches; although itself rather warm, it produces a few grapes and some of the fruits of the colder countries. Gwadul is distant from Pusunee about two marches and within two miles of the sea; both these places are between Debul and Mukran.

Kundava is a large place, affording no dates; it is situated among wilds—but is the capital of the Buroohee tribe.

Between Kundurabad and Gundava is a village district called Edul inhabited by Mohamedans and Infidels of the Buroohee tribe. Their cultivation is chiefly garden crops; grapes exist and also much cattle; it is a place of fertility. Edul was the name of a man who ruled in these parts, hence the designation.

<i>Distances.</i>	<i>Marches.</i>
From Teez to Keej, . . . . .	5
Punj Goor, . . . .	2
Punj Goor to Geuh.	
Teez.	
Punj Goor to Duzuk, . . . .	3
Rasuk, . . . .	3
Kulpoorah, ..	3
Asfukuh, ..	2
Bund, . . . .	1
Geuh, . . . .	1
Kusur Kund,	1
Keej to Gwadul, . . . . .	6! 2? Edresee says 2.
Pusunee, . . . . .	2
Dubeel, . . . . .	4
Munsooruh to Dubeel, . . . .	6
,, Moltan, ....	12
,, Zooran, . . . .	15

Easy journies.

Light marches.





**Khodzdar to Moltan, . . . . . 20** A town similar to Zooran.

The frontier of the Buroohee district to Munsooruh, 5 marches.

Ditto	ditto	to Keej, 10 marches, residence of Jesus, son of Madan.
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Ditto ditto to Teez Mukran, 15 marches.

The length of Mukran from Teez to Khozdar is 12 marches.

From Multan to the borders of Beloochistan called Balos, 10 marches.

Proceeding from Munsooruh to the Buroohee district, the Indus must be crossed at Shewan.

From Gundava to Mustong, a capital of the Belooch country, 4 marches.

Ditto ditto to Khozdar, 5 *fursukhs* ! (marches?)

Ditto ditto to Munsooruh, 8 fursukhs! (marches?) so given in Ouseley.

Ditto ditto to Moltan, 10 marches.

From Munsooruh to Kamuhul, 8

Cambay, .. 4 Situated 1 fursukh from the sea.

**Soobaruh,**      4      Situated  $\frac{1}{2}$  ditto ditto.

Sodan, . . . .	5	Ditto ditto.
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Mysore, .. 5

Ceylon, .. 5 31 marches.

Moltan to Besmed, . . . . . 2

Roof, . . . . . 3

Unuree, . . . . . 4

Kuluree, . . . . . 2

Munsooruh,.... 1 12 marches.

Dubeel to Bueroon, . . . . . 4

Haluree, . . . . .	2
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Kuluree to Bulree, . . . . .	4	Fursukhs.
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Sameyuh on the road to Kamuhul from Munsooruh, one march.

ON THE RIVERS.

One of the rivers is called the *Mehran*; I understand that its source is at the back of those mountains, whence also flow some of the feeders of the Juehoon (or Oxus). It reaches Moltan and passes to the district of Bismud—and Roor, and thence to Munsooruh; subsequently runs into the seas to the East of Debul. This river is a



very large one, its water ever sweet. They say it contains crocodiles like the river *Nile* ; to which it approaches in size and mode of tides ; —these rise over the country and then subside ; when the land is cultivated in the mode I have mentioned in Egypt.

The *Scind* river flows from a distance of three marches from Mol-tan ; a large stream of sweet water. It is understood to join the Mehran.

*Mekran* chiefly contains deserts and sands, being of little water at all seasons.

Between Munsooruh the water subsides into pools, round which in the fens and marshes resides a Scindian tribe called JAR, they consume chiefly fish and water-fowl resembling the Berber tribes.

Those afar from these marshes living on the plains are like unto the Koord races, consuming milk, cheese and bread. We have now finished the boundaries of Islam towards the East.



	اسامی مکمل	نامهای مشکوک	اسامی صحیح	اسامی کتانی
Zoran is a town of Kuchee ; Zuheree of Beloochistan. Sarawan is also a grand division of the Belooch country. ....	..	..	ذوران	طوران
The well known Burhoe or Buroohee tribe. ....	..	..	بروهه	بدهته
Map. ....	..	..	قصدار	قفص
I can offer no better identifi- cation of this word, than a not very improbable cor- ruption of Maheshwura to مهیسور or Mysoor—wrongly transcribed as Symoor; the situation between Sonda and Ceylon warrants the assumption. ....	صیمود	میصور	..	صیمور
Map points omitted. ....	..	..	تیز	سر
Map arabised. ....	..	..	کدیج	کر
Map—arabised spelling. ....	..	..	پنچ کور	فرور
Map. ....	..	..	درک	درک
Rasuk is mentioned by men of Mukran as 50 miles northward of Keej. ....	راسک	..	ن	راصل
Map; letters incomplete. ....	کسی	..	کیده	به
Map. ....	..	..	کسری کند	بدد
Map—Kussur Kund. ....	..	..	..	قصر قند
Map, Esfukea. ....	..	..	کلپوره	اصفقه
Map. ....	..	..	..	قافهه
Given in a MS. sketch of the Belooch tribes, as a district towards Mukran. Map; Much? ....	..	..	مشکی	مسکی
Map; and known to the ser- vants of the Umeers of Scinde, as a large harbour.	..	..	پسلی	قسلی
Gwadul. ....	قعدا بیل	کوادل	..	ارمائل
Mentioned in the Ayeen Uk- baree as the capital of Beloochistan. Well known.	مخالری	..	باجاره	مخاللی



	اسامی گذاری	اسامی صحیح	نامهای مشهور	اسامی مکرر
Map ; Shoorawuk. ....	سوره	شوراب	شوران	..
An erroneous transcription of } Gundaba, Gunjuva. ....	طمداندا	کذاوه	..	..
The servants of the Umeers } of Scinde suggest, <i>Emam-</i> <i>wah</i> , the name of a place or a stream of celebrity, for the Scindian <i>Mameewan</i> . <i>Munsooruk</i> remains to be identified. ....	منصوره	درزبان سند اصنام واه	..	صامیواذ
The servants of the Umeers } of Scinde say, Kurachee is the ancient Deebul. A history of Scinde mentions Bundure Lahooree as such.	دیبل	دیول	..	..
Unknown ; except that in the } required position there is given on the late Surveys of Scinde <i>Bryant</i> ; prob- ably a corruption. ....	بیرون	..	..	..
Untraced ; unless in the Ku- } luruh South-East of Hyde- rabad, in the late Surveys of Scinde. ....	قلری	کلری	..	..
Unknown—probably near } Nuoshuhr. ....	انری	..	..	..
Seyuds of Bulree are con- } stantly mentioned in the history of <i>Scinde</i> , a sure indication of antiquity. A <i>Bulury</i> is placed on the Map a little North and East of Tatta. ....	بلری	بلری	..	بکری
Unknown { Mussoowah and } Tuhur are sug- gested for these —as known places on the road to She- wan. ....	مسراهی تهرج	مسوای تهو	..	..
Unknown { Sameyah is considered to be } 20 miles Eastward of Tatuh. ....	صاده	صامیاه	..	..



	اسامي مكرر	نامهاي مشكور	اسامي صحيح	اسامي كتابي
A very slight upward turn to the tail of the dal; readily accounts for this change; it has crept into common acceptation: the derivation is Sheostan,— <i>Sudoosan</i> may be traced in all the works of Persian authority.	..	..	شيدوان	سدوسان
The towns of Bukur, Sukur and Roree were built from the ruins of Rooree, Ulroor, Roor, Alore. It was the capital of Upper Scind at the Mohamedan invasion.	..	..	روزی	رور
This may be <i>Kumbalea</i> or <i>Kumalea</i> , on the coast of the Gulf of Cutch; opposite to the port of Maundoe.....	..	..	..	قامهل
Cambay <i>Cambaja</i> an ancient city in the province of Gujarat, the sea port of Uhmudabad. ....	..	..	..	کذبایه
Severndroog <i>Suvarna Durga</i> the Golden Fortress; a small rocky isle on the coast of the Concan, 86 miles S. E. from Bombay. Celebrated in modern times as the residence of the Pirate Angria.....	..	..	..	سواره



	اسامي مكررا	اسامي مشكوك	نامهاي صحيح	اسامي كتابي
Soonda or Sudha, situated above the Western ghauts in Canara. An ancient place celebrated for pepper and rice; 44 miles N. E. from Onore. ....	سندان	..	..	سدان
An environ of Moltan—unknown. ....	..	..	..	جندادر
Unknown, probably near Ooch. ....	سمد و سهند	..	..	بسمت
As no proper head can be found to wear the title of <i>Bulhura</i> , I suggest it as a fragment of the word Maharajah; the meaning of the word is said to be <i>King of Kings</i> in the French translation of Edreese. ..	..	مہاراجہ	..	بلہرا
Perhaps an arabized plural of Poesuh <i>Faezutat</i> . ....	..	..	فائذیات	فاسدات
The dye called mujeet? also leather. ....	..	..	سُختیان	سحیان
Huluree is marked on the map West of Tatu, but far from the river; there exists the celebrated Helayuh ferry which may be the ferry to Munsooruh, which city will then lie between this ferry and the bifurcation of the Gongra. ....	صحالي	گذر معروف به هلايه	..	حالري
An arabized form of Gundabuh or Gundawa. ....	..	..	کنجاہ	قندابیل
Said by the servants of the Umeers of Scind, to be on the confines of Mukran. ....	..	..	..	واہوق
Mentioned as a large fertile valley inhabited by the Meerwanee tribe; near Punj Goor. Map Koolaj?	..	..	..	کلوان



	اسامي مكرر	اسماي مشكور	ناماي صحيح	اسماي كتابي
A large party headed by Ushush bin Kues deserted the side of the Emam Ulee and set up one Abdullah bin Duhub, as Governor. They were cut up at Nehrwan by the Emam. The few who escaped, migrated to foreign countries and their descendants are known as the Khurooj tribes. . . . .	خوارج	..	خوارج	خروج
Constantly mentioned as a district of Beloochistan towards Mukran. . . . .	..	..	..	جدران
Already mentioned as Mush-kee. . . . .	مسكاوي مسكى	..	مشكى	مسكان
Having the same meaning as Khurooj. . . . .	..	..	..	شراة
Looks as a fragment of Se-kundurabad; but I am told that Kundurabad is now a small village near Teeree and Mustong—and is considered to have been once a place of importance. . . . .	..	..	..	کندراباد
I find mention of Kue Kanan in the history of Scind, and men of Peeshing say they view it as Koh Kanan—Koh Kan—the modern Kunuhk. . . . .	..	کوه کانان کنک	..	کبرادابان



	اسامي مكرر	اسامي مشكور	اسامي صحيح	اسامي كذا
Edul—? Meel, .....	..	ايدل	..	بايدل
Grain or fruits raised near home in gardens as opposed to the crops of field cul- tivation. ....	..	..	جوس	نچوس
Edul?—Meel? .....	..	ايدل	..	ايل
Zat—Jat.....	..	مند	..	ذطه

### NOTES.

*Mysore*.—The reading of *Seemood* or *Seemoor* as *Mysore* is exceedingly bold ; requiring more than ordinary latitude ; but, the position warrants the assumption. Notice may also be taken, that being the name of a large district, we have not as in the previous smaller places Sodan and Soobaruh any more precise indication in the distance from the ocean.

Few particulars of detail are to be looked for, in a work, that jumps from Scinde to Ceylon in 31 marches, with only the names given of five. The route is about similar to a statement that the stages from Calcutta to London are, Madras, Ceylon, Aden, Suez and Alexandria. I am inclined to consider *Seemood* may be the Lungoor of Hiuan Thsang ;—in it he states to be a *stan* to the Maha Eeshwuruh—which is the arch type of *Mysore* ! But MUNGALORE is not unlikely to furnish a better Lungoor.

*Maharajah*.—Edresee contains a passage, that the meaning of the word Bulhura is “ *king of kings*.” Some people object, that Bulhura is found in almost all early writers, Arabian or Persian. But we know how few are the original writings of these early periods, how the errors of the first transcribers become stereotyped for ages ; how copies are made from copies until all correctness is lost. For example, Sudoosan



may be traced in the most early writings of the best authors as the name of the town Shewan or Sheowan. A result not unnatural to the peculiar forms of the Arabian yee and dal in early writing.

*Munsooruh.*—The position still remains a problem to be solved as it no doubt will be, by the antiquarian research now in operation throughout Scinde. Its ruins will be found to be between Tatta and Hydrabad. The modern surveys contain a stream called the Emam; Wah is said to be generic in the language of Scind for rivulets. Leemoonuh is the Arabian type of our Lemon; better followed than is the Indian Umbuh by *Umbuj* or by *Mangoe*.

*Deebul* is the Arabian form of Deewul or Deewal—derived from Deeo-aluh the place of the idol; as Sheeo-aluh.

*Copper puesa.*—This is the best attempt that I can offer, at a word either corrupted or illegibly transcribed. Sir William Ouseley reads *Kaheri*; a term not elsewhere to be found.

Five derhems of silver, say 325 grains, is about the actual weight of the silver in the crown piece. This coin may by the Red Sea, or down the Persian Gulf, or even by the land route, have readily reached so large an emporium of eastern trade as the mouths of the Indus.  $1\frac{2}{3}$  of a derhem, say 80 to 90 grains, is considered about the proposed weight of the Coins of the early Bokhara Torkee dynasties; such, I presume to be indicated by the generic title of *Tatar*.

*Beeroon.*—This word is stereotyped into authority; as we find an author of celebrity called Beeroonee, said to have been born in this town. But I believe the adscription to be an error; such should be, to a place called Beeroon in Kharison.

*Kamahul.*—I can only suggest, Kumbalea or Kumalea; as in some measure meeting the required conditions,—of being on the borders of the two dominions.

If attention is given to the Nozhut olkoloob; there exists the following route with its measurement.

From Deebul to the Mehran, a river of Scinde, . . . . .	2	fursukhs.
to Radnugur (Rhadanpore) which is		
the frontier town of India, . . . . .	40	—
to Koollee, . . . . . (30)	×2	
to Sumundan, . . . . . (48)	××	
to Mulebar, . . . . .	50	



to Talyan or Putun, . . . . .	20	
to Ceylon by two days on the sea, ..	10	80
		<hr/>
The total is given as, . . . . .	200	
Hence for the lacunæ we have, . . . . .	78	

Now assuming Sumundan to be Sondan; the last distance of 80 fursukhs may be considered a rough approach to the facts. Edresee gives Koollee as 6 miles from, say identical with, Cambay, so that we may safely divide the difference between the two lacunæ, as above proposed in 32 and 48 fursukhs.

Putun is mentioned as a port of Mulebar, by Ebne Batuta.

The difference of latitude between Tatta and Ceylon is about 16 degrees.

The Nozhutol Kooloob makes the distance, . . . . . 200 fursukhs.

Ebne Huskul estimates the way as, . . . . . 31 marches.

*Zooran*.—I can obtain no evidence of this term ever having been used to designate the country hord called Beloochistan.

*Gwadul*.—The conversion of Kundabeel or as it is also written Urmaßeel into Gwadul may or may not receive assent. I can obtain no trace of the two types given, but قندابل will to the eye accustomed to such transformations not appear very wide of قودل.

*Kuburadaban*.—Does not strike the ear as a correct word. I find in the History of Scinde one of the districts neighbouring on Scinde called Kue Kanan. Men of Peeshing have suggested this to be Koh Kanan, the modern Kunuh a small place between Shal and Kelat-i-Nuseer.

*Faneez*.—A species of sugar—treacle.

*Jats*.—The present wandering tribe to the East of the Punjab. In the previous portion, and in all European printed books, I find *Mund*: a tribe I never elsewhere noticed. I suspect and boldly adopt Jat as the correct word; by copyists ذط ذط Zal, toee, might soon be turned into مند.

*Kundurabad*.—Is said to exist near Teeree and Mustong.

*Edul*.—So may be read ادل, from the constant interchange observable between و and ي. This word has been given as *Eel*—*Ubul*—*Utul* and *Meel* in various translations. Edul Khan is the family title of



the chief of Nohskue a district most near to the position indicated. A stream called *Meel Manduh* in the Peeshing valley is not far from the required position.

*Scind river.*—This limits this designation to the portion of the Cheenab between the junction of the Rawee and the junction of the Indus—from Tolumba to Mittun.

Interest may attend a review of the opinions entertained by the natives of Scinde on the history of their own cities. Deewal, Buhnoor, Nugar and Teeruh were the names of towns succeeding each other on the ruins of the predecessor. They were all located in the *Sagure Gharuh* or *Sagwurruh*.

At last the district appears to have obtained the name of Tutuh; under which title the Jam Nuzamoldeen, known as the Jam Hindoo, formed the modern city in the year 905 of the Hejree:—the original town by him enlarged into Tath was called Zublak.

Nueroon Koot was a celebrated fort situated near the modern Hyderabad. It capitulated to Mohummud Kasem the early conqueror of Scinde, by degrees the place was neglected and the fort became a heap of ruins until Mean Gholam Shah Koollee Khan from them raised the modern fort of Hyderabad.

Sheowestan, Seewan Schwan, is one of the most noted places of antiquity on the country. Sometimes independent sometimes subject to either Tutuh or Alore.

Alore constituted the capital of the earliest known Rájáhs of Upper Scinde and was captured by Mohummud Kasem. Subsequently its canals and wells having dried up it was deserted for towns nearer to the river as Bhukur, Sukhur, and Loohuree now called Rooree. So that Alore is now considered a village of Bhukur.

## واما بلاد السند

وما يصاقبها مما قد جمعناه في صورة واحدة فهي بلاد السند  
وشي من بلاد الهند و مكران و طوران و البدهة و شرقي ذلك كله



بحر فارس و غربيه كرمان و مفازة سجستان و اعمال سجستان و شماليه  
بلاد هند و جنوبيه مفازة بين مكران و الفعض و من ورائها بحر فارس  
و انما صار بحر فارس محيط شرقي هذه البلاد و الجنوبي من وراء  
هذه المفازة من اجل ان البحر يمتد من صمود على الشرقي الى  
بحر بين مكران ثم يعطف على هذه المفازة الى ان يتقوس على  
بلاد كرمان و فارس \* و مادة صورت بلاد السند

والذي يقع من المدن في هذه البلاد بناحية مكران و السرو و كدر  
قنولور و درك و راسل و هي مدينة الخروج و به وند و مصروند  
و اصقعه و فلقهره و مسكي و قنلي و ارمادل و اما طوران فان مدنها  
محالي و كيتفكان و سوره و قصدار و اما البدهه فان مدينتها طندان  
و اما مدن السند فانها المنصورة و اسمها بالسندية ناميوان و الديبل  
و الديرون و قادي و انري و بلري و المسراهي و الدهرح و نانه  
و مخابيري و سدوسان و الدور و اما مدن الهند فهي فاهل  
و كنباته و سوباره و سدان و صيمود و المليان و حنדרاور و بسمت  
فهذه من مدن هذه البلاد التي عرفناها و من كنباية الى صيمود من بلد  
بلهرا بعض ملوك الهند و هي بلاد كفر الا ان هذه المدن فيها المسلمون  
و لا يلي عليهم من قبل بلهرا الا مسلم و بها مساجد يجمع فيها  
الجماعات و مدينة بلهر التي تقدم فيها ما كدر وله مملكة عريضة \*  
و المنصورة مدينة مقدارها في الطول و العرض نحو من ميل  
في ميل و يحيط بها خليج من نهر مهران و هي في شبيه بالجزيرة



واهلها مساكين و ملكهم من قريش يقال انه من ولد هبار بن الاسود قد  
 تغلب عليها هو واجداده الا ان الخطبة بها للخليفة وهي مدينة حارة  
 بها نخيل و ليس لهم عذب و لا تُفّاح و لا كمثرا و لا جوز و لهم قصب  
 سكر و بارضيهم ثمرة على قدر التفاح تسمى ليمونة حامض شديد  
 الحموضة و لهم فاكهة لسم الخوخ يسمونها الانج يقارب طعم الخوخ  
 و اسعارهم رخيصة و فيها خصب و نقودهم الفاهريات كل درهم نحو  
 خمسة دراهم و لهم درهم يقال له الطاطري في الدرهم وزن درهم  
 و ثلثين و يتعاملون بالدنانير ايضا و زبيهم زي اهل العراق الا ان زي  
 ملوكهم يقارب زي ملوك الهند من الشعور و القراطق •

و اما الملتان فهي مدينة نحو نصف المنصورة و يسمى موح  
 بيت الذهب و بها صنم تعظمه الهند و يحجّ اليه من اقاصي بلدانها  
 و يتقرب الى هذا الصنم في كلّ سنة بمال عظيم لينفق على بيت  
 الصنم و العاكفين عليه منهم و سميت الملتان بهذا الصنم و بيت  
 هذا الصنم قصر مبنّى في اعمر موضع بسوق الملتان بين سوق  
 العاجيين و صف الصفارين في وسط هذا القصر قبة و الصنم فيها  
 و حوالى القبة بيوت يسكنها خدم هذا الصنم و من يعكف عليه  
 و ليس بالملتان من الهند و السند الدين يعبدون الاوثان غيرها و لا  
 الذين هم في هذا القصر مع الصنم و هذا الصنم صورة على خلقه  
 الانسان متربع على كرسى من جص و آجر و الصنم قد لبس  
 جميع جسده جلد سمه الستجيان احمر حتى لا يتبين من



جثته شى الا عيناه فمنهم من يزعم ان بدنه خشب و منهم من يزعم انه من غير الخشب الا انه لا يترك بدنه ينكشف و عيناه جوهرتان و على راسه اكليل ذهب متربع على ذالك الكرسي قد مد ذراعيه على ركبتيه و قد قبض اصابع كل يديه كما يحسب اربعة و عامة ما يحمل الى هذا الصنم من المال فانما ياخذة امير الملتان و ينفق على السندته فاذا قصد هم الهند للحرب و انتزاع هذا الصنم منهم اخرجوا الصنم فاظهروا كسرة و احراقه فيرجعون و لولا ذالك لخربوا الملتان و على الملتان حصون منيعة و هي خصبة الا ان المنصورة اخصب و اعمر منها و الملتان انما سمى بيت فرج بيت الذهب لانها لما فتحت فى اول الاسلام كان فى المسلمين ضيق و قحط فوجدوا فيها ذهبا كثيرا فانتعونه و خارج الملتان على مقدار نصف فرسخ ابنية كثيرة تسمى حدرا وروهي معسكر الامير لا يدخل الامير منها الى الملتان الا فى الجمعة فيركب الفيل و يدخل الى صاواة الجمعة و اميرهم قرشى من ولد كنانة بن كوى قد تغلب عليها ولا يطيع صاحب المنصورة الا انه يخطب للخليفة .

و اما سمد فهي مدينة صغيرة و هي و الملتان و حدراور عن عين شرقى نهر مهران و بين كل واحدة منها و بين النهر نحو فرسخ و ماء هم من الآبار و سمد هذه خصيبة و مدينة الزور يقارب الملتان فى الكبر عليها سوران و هي على شط نهر مهران و هي من حد المنصورة و الدبيل هي غربي مهران على البحر و هي متجر كبير



و فرضة لهذه البلاد و غيرها وزروعهم مداحس و ليس لهم كبير شجر  
ولا نخيل و هو بلد قشف و انما مقامهم للتجارة •

والديرون مدينة بين الديبل والمنصورة على نحو من نصف الطريق  
وهي الى المنصورة اقرب و من جانبي على غربي مهران وبها يعبر  
من جاء من الديبل الى المنصورة وهي بحذاءها والمسواهي والمهرج  
وسدوسان هذه كلها غربي مهران واما ابزي ولدي فهما شرقي مهران على  
طريق المنصورة الى الملتان و هما بعيدتان من شط مهران و اما بلري  
فهي على شط مهران عن غربيه يقرب الخليج الذي ينفجر من مهران  
على ظهر المنصورة •

و اما ناده فهي مدينة صغيرة و فيها عمر بن عبدالعزيز البباري  
القرشي جد هؤلاء المتغلبين على المنصورة و قامهل مدينة من اول  
حد الهند الى صيمود فمن صيمود الى قامهل من بلد الهند من  
قامهل الى مكران و الدده و ما و الا ذلك الى حد الملتان هي  
كلها من السند و الكفار في حدود بلد السند انما هم الدده و قوم  
يعرفون بالمسد و اما الدده فهي مفترشة ما بين حدود طوران و مكران  
و الملتان و مدن المنصورة و هم في غربي مهران و هم اهل ابل  
و هذه الفاليج الذي يحمل الى الآفاق بخرسان و فارس و سائر البلاد  
التي يكون بها المحتاي انما تحمل منه و مدينة بدهه التي يتجرون  
اليها قذ ابل و هم مثل البادية لهم اخصاص و اجام و المديهم على  
شطوط مهران من حد الملتان الى البحر و لهم في البرية التي بين



مهران وبين قامهل مراعى و مواطن كثيرة ولهم عدد كثير وبقامهل  
وسداف وصيمود و كنبانة مسجد جامع و فيها احكام المسلمين ظاهرة  
وهي مدن خصبة واسعة و بها النارجيل والموز وانبج والغالب على  
زروعهم الارز و بها عسل كثير وليس بها نخيل و الداهوق و كلوان رستاقان  
متجاوزان و هما بين كس و ارماسل \*

فاما كلوان فهي من مكران و اما الداهوق فهي من حد المنصورة  
وهي مناجس قليلة الثمر قشقة الا ان لهم مواشي كثيرة و الطوران  
قصة القصدان وهي مدينة و بها رستاق و مدن و الغالب عليها رجل  
يعرف بمغير بن احمد يخطب للخليفة فقط و مقامه بمدينة يعرف  
بكركامان وهي ناحية خصبة واسعة الاسعار و بها أعذاب و رمان و فواكه  
الصرود وليس بها نخيل و بين داه و قامهل مفاوز و من قامهل الى  
كنباته ايضا مفاوز ثم يكون حينئذ من كنباته الى صيمود قرا متصلة و عمارة  
الهند و زي المسلمين و الكفار بها واحد في اللباس و ارسال الشعر  
و لباسهم الازر و الميازر لشدة الحر ببلدانهم و كذلك زي اهل الملتان  
لباسهم الازر و الميازر و لسان اهل المنصورة و الملتان و نواحيها العربية  
و السندية و لسان اهل مكران الفارسية و المكرية و لباس القراطق فهم  
ظاهر الا التجار فان لباسهم القمص و الأردية و سائر زي اهل فارس  
و العراق و مكران و ناحيه واسعة عريضة الغالب عليها اللحاء و القحط  
و الضيق و المتغلب عليها رجل يعرف بعيسى بن معدان و يسمى  
بلسانهم مهيا و مقامه بمدينة كبيرة وهي مدينة نحو النصف من  
الملتان و بها نخيل كثيرة و فرة مكران و بلد النواحي تيز و تعرف



تتيز مكران و اكبر مدينة بمكران العديوت و منبه و بند و مصرفند  
و درك و مهلقه كلها مدن صغار و هي كلها جروم و لهم رستاق يُسمى  
الحروح و مدينتها راسل و رستاق تُسمى جدران و بها فانيذ كثير  
ونخيل و نصب سكر و عامة الفانيذ الذي تحمل الى الافاق فيها الاشياء  
يحمل من ناحية ماسكان و بصدان ايضا فانيذ و مسكن هذه رستاق  
الشراة و يتصل بنواحي كرمان ناحية تُسمى مسكاوى مدينة قد تغلب  
عليها رجل يعرف بمطهر بن رجا و هو لا يخطب الا للخليفة و لا يطيع  
احدا من الملوك المصاقبين له و حدود عمله نحو ثلاث مراحل و بها  
نخيل قليل و شيء من فواكه الصرود على انها خير من ارمابيل و بينهما  
مقدار منزلتين و بين ارمابيل والبحر مقدار نصف فرسخ و هما بين  
دبيل و مكران و قندابيل مدينته كبيرة ليس بها نخيل و هي في  
برية و هي ممتاز البدهه و من كندراباد و بين كبرادابان و قندابيل  
رستاق يعرف بداندل و فيه مسلمون و كفار من البدهه و اكثر زروعهم  
النجوس و لهم كروم و مواش و هي ناحية خصبة و اسل هو اسم  
رجل تغلب على هذه الكورة فُنُسبت اليه •

و اما المسافات بها

فمن مر الى كدر نحو خمس مراحل و من كدر الى مدربور مرحلتان  
و من اراد بين فربود الى تيز مكران فطريقها على كبي و من مدربور  
الى درك ثلاث مراحل و من درك الى راسل ثلاث مراحل و من  
راسل مهلقهرا الى اصعفه مرحلتان خفيفتان و من اصعفه الى  
بند مرحلة و من بند الى به مرحلة و من به الى مصر قبل مرحلة  
و من كدر الى ارمابيل ست مراحل و من ارمابيل الى مسي  
مرحلتان و من مدلى الى الدبيل اربع مراحل و من المنصورة الى



الدبيل ست مراحل و من المنصورة الى الملتان اثنا عشر مرحلة  
 و من المنصورة الى طوران نحو خمس عشرة مرحلة و من قصدان  
 الى الملتان نحو عشرين مرحلة و من قصدان نحو مدينة  
 طوران و من المنصورة الى اول حد البدهة خمس مراحل و من  
 كير مسكن عيسى بن معدان الى البدهة نحو عشر مراحل  
 و من البدهة الى التيز نحو خمس عشرة مرحلة و طول عمل مكران  
 من تيز الى قصدان نحو اثنا عشر مرحلة و من الملتان الى اول  
 حد و الستان المعروف بدالس نحو عشر مراحل و يحتاج الى عبور  
 المهران اذا اردت بلاد البدهة من المنصورة الى مدينة تُسمى سدوسان  
 على شط مهران و من قنذا بيل الى مدمح مدينة نالس اربع مراحل  
 و من قصدان الى قنذا بيل نحو خمس فراسخ و من قنذا بيل الى  
 المنصورة نحو ثمانية فراسخ و من قنذا بيل الى الملتان مقدار نحو  
 عشر مراحل و بين المنصورة و بين قامهل ثمان مراحل و من قامهل  
 الى كذبايه نحو اربع مراحل و كذبايه على نحو فرسخ من البحر  
 و من كذبايه الى سوباره نحو اربع مراحل و سوباره من البحر على  
 نصف فرسخ و بين سوباره و سدان نحو خمس مراحل و هي ايضا  
 على نصف فرسخ من البحر و بين صيمود و بين سندان نحو خمس  
 مراحل و بين صيمود و سرانديب نحو خمس مرحلة و بين الملتان  
 و سمد نحو مرحلتين و من سمد الى الرود نحو ثلاث مراحل  
 و من الرود الى ايري اربع مراحل و من ايري الى قلدي مرحلتان  
 و من قلدي الى المنصورة مرحلة و من الدبيل الى مرون اربع مراحل  
 و من مرون الى بحاري مرحلتان و من قلدي الى مكري نحو



اربع فراسخ وسامده هي بين المنصورة و بين فامهل على مرحلة  
من المنصورة •

و اما انهارها فان لهم نهرا يعرف بمهران وبلغني ان مخرجه من  
ظفر جبل يخرج منه بعض انهار جيحون فيظهر مهران بناحية  
الملتان فيجري على حد سمد والزود ثم على المنصورة حتى يقع في  
البحر شرقي الدبدل و هو نهر كبير عذب جدا و يقال ان فيه تماسيح  
مثل ما في النيل و انه مثل النيل في الكبر و جريه مثل جريه  
يرتفع على وجه الارض ثم ينضب فيزرع عليها مثل ما ذكرناه في  
ارض مصر و السندروذ من الملتان على نحو من ثلاث مراحل و هو  
نهر كبير عذب بلغني انه يفرع الى مهران و اما مكران فان الغالب  
عليها البوادي والمباخس و هي قليلة الانهار جدا ولهم ما بين المنصورة  
مياه من مهران كالبطائح عليها طايفة من السند يعرفون بالزط فمن قارب  
منهم هذا الماء فهم في اخصاص و طعامهم السمك و طير الماء في  
جملة ما يتغذون به و من بعد منهم في البراري فهم مثل الاكراد قد  
انتهينا في حد المشرق الى آخر حدود الاسلام •

*Second Notice on the Argentiferous Ores of Deoghur.*—By HENRY  
PIDDINGTON; Curator, Museum of Economic Geology.

In my first notice of these remarkable ores (Journal Vol. XX. p. 1.  
I stated that several of them contained silver, and were in fact the  
true Mexican *Colorados* and Peruvian *Pacos*, and that working a pound  
weight of two of them by the Spanish Amalgamation process, I had  
obtained an average produce of  $8\frac{1}{4}$  and 13.5 Marcs of silver: I also  
stated that some of the ores contained more promising proportions of  
silver.





Our zealous contributor Capt. Sherwill having sent me a box of the ores from which I obtained 14 lbs. weight of them, I have worked the whole quantity at once; and as all these new operations and results are of interest, I describe the ores and the variation of the process which was not exactly the same as before.

A. 9 lbs. Adv. weight of a dark dull liver-coloured and earthy green ore, a mixture of carbonates and sulphurets of copper and oxide of iron, with a few specks of yellow sulphuret like a very dull peacock ore. Its external coat is of a bright *Colorados* red.

B. 5 lbs. Adv. weight of the same ore, clouded and mottled with red and green earthy masses, as if in process of being converted into a *Colorado*; the external coat also the same as A.

Both kinds of the ore contain a little Bismuth.

These 14 lbs. weight of ore were very gently roasted to form the *magistral* from the sulphuret of copper of the ore, which is one variety of the Mexican modes of treating this class of them; and the colour of the pulverised ore changed in this operation from a greenish to a reddish brown. The salt and mercury were added as before, so as to insure the extraction of the whole of the silver; and both kinds when washed off were found to give so nearly the same proportional produce that the whole may be taken as one lot. The separation of the whole of the silver was found to be complete, as none could be detected in the residuum from the washings.

The 14 lbs. of ore produced 154 grains of pure silver (165 grains, or the produce of 15 lbs of the ore would be required for the weight of pure silver in a rupee), and this I have had manufactured into a medal with the following inscription on each side of it.

JAMES ANDREW,  
MARQUIS OF DALHOUSIE  
*Governor-General of India*  
1852.

H. P. CURATOR.

1852.  
**BENGAL SILVER**  
From Deoghur  
180' N. W. of Calcutta.  
Amalgamated  
From Ore of  $15\frac{1}{2}$  Marcs.  
or  $\frac{1}{636}$ .

154 grains of silver from 14 lbs Avoirdupois weight of ore is 11 grains to a pound weight; this would be called by a Mexican Miner,





ore of  $15\frac{1}{2}$  Marcs\* to the *Caxon* (of 5000 lbs. Adv.) so that it will be seen, referring to what I have already stated in my former paper, that this is far above an average ore. In practice, however, on the large scale, as all the silver is not extracted, it would rank something lower.

It is perfectly impossible to say what this ore at the surface may be the indication of; but assuredly, for any thing we know, or I fear are likely to know for years to come, we may have a whole Mexico within our reach, though now buried amongst the forests and beneath the rocks of Birbhoom.

*On HIRCINE, a new Resin, by HENRY PIDDINGTON; Curator,  
Museum of Economic Geology.*

1. I have not ventured yet to announce this as a new *mineral* Resin, though I think it may be so. It was placed in my hands by Mr. Theobald, Senior, with a request that I would examine it. Mr. Theobald has not yet been at liberty to furnish me with any memoranda regarding its locality, but expects soon to be able to do so.

It should be observed that we had only a small lump of it weighing barely an ounce Troy; and it was of course desirable to keep as much of this as possible for a Museum specimen.†

2. This resin is brown on the external parts and of a very brown yellow colour internally.

3. It is generally opaque, but is slightly translucent at the edges.

4. It is tough to break, and very tough and elastic, leaping out of the mortar if not covered up, while pounding.

5. Its fracture is hackly in small pieces, but conchoidal in the large.

6. Its specific gravity is 1.10, but if freed from the external rough coat, which could not be completely divested of air bubbles, it would probably be 1.2 or thereabouts.

\* The Spanish Marc is  $3550\frac{1}{2}$  grs. troy.

† Persons desiring to have specimens chemically examined should always remember that it is far better to send large specimens than small ones, on very many accounts. To a Museum they cannot send them too large or too numerous in kind, variety, matrix of ores, &c.





7. It melts and drops in the flame of a candle, and an impression may be taken upon it; resembling in this respect very bad bazar sealing wax.

8. It burns in the forceps, or in a porcelain capsule, with a blazing yellowish flame, with numerous strong jets of gas, and a dark smoke like the best bituminous coal. Towards the end of this first combustion it swells into a round, tough, carbonaceous ball, and the flame expires. This ball has a very peculiar semi-animal odour which may be described as that of coarse hair, or *HIRCINE*, whence its name; but it is not so strong as to be altogether disagreeable. When this coal is again heated upon a large piece of platinum foil it swells, and flames, and jets exceedingly, the gaseous emanations covering the whole of the platinum foil with flame, as if alcohol, ether, or naphtha was projected from the burning mass! When the flame, expires it leaves a very light charcoal and a coat of grey dust on the platinum. The whole of this dust and coal, when burned to a grey ash in a platinum crucible, is found by acids and the blowpipe to consist of minute portions of Iron and Silica without any trace of Lime or Alumina.

*Solubility in Water.*

9. By boiling in distilled water it softens, and the powder gives out with the steam the peculiar odour above alluded to. It does not colour the water in any material degree, but Nitrate of silver renders the solution slightly turbid. When it is evaporated, a slight portion of a white gummy matter is left in the capsule which has no smell or taste; so far at least, as a minute trial with a small quantity of the resin could ascertain.

*In Alcohol.*

10. It is but little soluble in cold Alcohol. In boiling Alcohol about one-half of it, or less, is dissolved when powdered, giving a gold yellow solution; the insoluble part is a brown granular residuum, and the Alcohol has flaky white masses suspended in it which do not settle. These collected on a filter give a greyish white crust, which boiled in fresh Alcohol dissolves also, leaving only a little granular deposit; the Alcohol remaining colourless. Upon platinum this white crust flames quickly with a bright white flame and burns without any residuum but always with the peculiar hircine odour, though not in so strong a degree. When the Alcoholic solution of the white crust is evaporated



it leaves a dirty greyish white mass which has an agreeable odour but does not, in the small quantity experimented upon, resemble a resin, as it coagulates in clots and masses in the watch glass.

The Alcoholic residuum is a light brown resin which burns with a bright clear flame and leaves a white powdery ash as before. The latter portions of the smoke have a musky odour, which, like the hircine one of the original resin, is not disagreeable.

This Alcoholic residuum is insoluble in ether, or but very partially soluble, giving only a faint yellow colour to it.

When the pure and filtered yellow Alcoholic solution is allowed to evaporate, it gives an orange-coloured resin, which burns with a bright, clear, yellow flame after fusing to a bright orange red mass.

This resin is almost totally soluble in ether, giving a bright yellow solution with but a trifling residuum. Its smell is a strong sugary one, like a cask or fasil of raisins.

*With the Acids.*

11. In concentrated Nitric Acid it becomes a tough, bright, yellow pasty and frothy mass, and partly dissolves; colouring the Acid of a bright straw-yellow colour. The pasty residuum adheres somewhat to the fingers, but could not be farther examined.

The Nitric Acid solution gives a white precipitate to Carbonate of Potass which is mostly soluble in an excess of the Alkali, but a portion of it remains as a silky precipitate like those of salts of Barytes.

In Acetic Acid it also gives a straw-yellow solution which is precipitated by Carbonate of Potass, but this precipitate does not appear to be soluble in excess of the Alkali, and is silky like the residual precipitate from the Nitric Acid solution above described. When the Acetic Acid solution is evaporated it gives a brown resinous-looking material which is soluble in Alcohol.

Its re-actions with strong Sulphuric Acid are the most remarkable, and with the effect of Nitric Acid on the Alcoholic solution seem quite to distinguish it from any of the resins or gum resins of which we have any record.\*

\* Mr. Hatchett, Phil. Trans. for 1806, p. 92, says, that Guaiacum gives also a deep red colour to Sulphuric Acid but then it undergoes various changes of colour, from green to blue and brown, when Nitric Acid is added to the Alcoholic solution; which as will be subsequently seen Hircine does not. Hircine in the mass looks much



It dissolves almost totally (leaving only I think a few of the surface impurities) giving a deep blood-red solution which appears like inspissated venous blood, which after some days changes to a deep brown. When diluted this solution becomes of a dull, dirty, troubled white colour.

With Carbonate of Potass a white cloudy and silky precipitate is shewn.

Dropped into ammonia with precaution it colours the solution brown, and finally when left to settle after saturation, gives clots of a dark brown glutinous matter, which seem to be the original resin in a softened state.

*The action of the Acids on the Alcoholic solution.*

12. It appeared worth while to examine this, as these effects are well marked with guiacum and some other of the resins. The results were—

The Alcoholic solution, with Nitric Acid diluted with one-fourth water, changes only from a golden brown to a clear gold colour and no change occurs after 48 hours.

The same takes place with Phosphoric Acid, with a slight white deposit.

With Sulphuric, Muriatic, and Acetic Acids a white precipitate is produced which is less plentiful with the Acetic Acid than with the two first. In all of them the fluid shews no alteration of colour, except as above noted from a golden brown to a clear yellow or golden colour.

13. We cannot from so small a portion form any opinion of its economical uses as a varnish, or for sealing wax, or any of the purposes to which shell-lac is supplied, nor can I afford any of it to ascertain its habits with Turpentine and Naphtha. We are also ignorant if it is abundant and at what rate it can be obtained. For the present then I have only named it, provisionally, **HIRCINE**.

more like a piece of Guaiacum wood (*Lignum vitæ*) as to colour, but not weight, than like the gum resin of that name, which indeed it does not at all resemble.





PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR JANUARY, 1852.

At the Annual General Meeting of the Asiatic Society of Bengal held on the 7th of January 1852, at half past 8 p. m.

Honourable Sir JAMES COLVILE, Kt. President, in the chair.

Mr. *L. Clint* was named for ballot at the next Meeting ;—proposed by the President and seconded by Dr. A. Sprenger.

The proceedings of the preceding Meeting were read and confirmed.

The following Annual Report was next received and adopted.

ANNUAL REPORT

READ AT THE ANNUAL GENERAL MEETING OF THE SOCIETY,  
ON THE 7TH JANUARY, 1852.

The Council have the satisfaction of submitting their usual Annual Report on the Society's affairs for the past year, and in the remarks which they have to make will observe the order followed in last year's Report.

The Society have to report the loss by death of four, and by withdrawal of fifteen members. The first four include the name of Major J. D. Cunningham, a distinguished officer and student, who had contributed several able papers to the Journal. There have, however, been ten admissions during the year, and the Society now numbers one hundred and thirty members, of whom six only are absent in Europe.

*Finances.*—The prospects held out in the Finance Committee's Report of last year (*Jany. 3rd*, 1851,) have been fully realized. The Society's accounts have been subjected to monthly and careful scrutiny by the same Committee. The liabilities have been reduced by Rs. 1804-10,\*

<p>* Debt paid off . . . . Rs. 1,804 10 0</p> <p>Surplus income after payment of the above debt, 1,770 2 11</p> <hr style="width: 20%; margin-left: 150px;"/> <p style="text-align: right;">Rs. 3,574 12 11</p> <p>Annual surplus as estimated in last year's Report, . . . . . 3,000 0 0</p>	<p>and the year now commenced should show the Society entirely free from embarrassment. In substantiation of this fact, the Council have only to point to the following abstract of the past year's</p>
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accounts. This excludes the Government grants which are made for specific objects, and exhibits only the strength, and the use made, of the Society's own resources.

## INCOME.

Contributions, .. .. .	8,839	4	5
Library, .. .. .	105	8	0
Sale of Oriental Publications, .. .. .	1,417	8	6
Journal, .. .. .	1,222	0	0
	<hr/>		
	11,584	4	11

## EXPENDITURE.

Zoological Department, .. .. .	643	3	3
Library, .. .. .	2,080	1	3
Sale of Oriental Publications, .. .. .	1	8	0
Journal, .. .. .	3,383	5	9
Secretary's Office, .. .. .	848	0	6
Building, .. .. .	39	7	0
Miscellaneous—including 1804-10 of liabilities cleared off, .. .. .	2,914	9	6
	<hr/>		
Total, ..	9,910	3	3

Surplus income, .. 1674 1 8

Thus with the balance in hand on the 30th December, 1850, of Rs. 1,674-1-8 the year's management shows a present available cash balance of Rs. 3,481-9-1. If against this assets be placed the full remaining amount of the Society's liabilities, pressing *or otherwise*, viz. Rs. 4,584-14-1, it will be seen that Rs. 1,103-5 only, or a sum considerably within the above surplus, has to be liquidated in the course of the current year.

The outstanding assets of the Society under all heads are rated at Rs. 14,264-3-4, more than half of which is supposed to be recoverable. The attention of the Finance Committee will now be given to the determination of the true character of these assets, to the recovery of such as are available, and to the removal from the accounts of such as are not likely to be realized.

The estimated income from contributions for the current year may be taken at 8,000 Rs., while of the other sources, that from the sale of



Oriental Publications is decidedly improving. The Council therefore may fairly congratulate the Society on the immediate prospect of seeing its finances re-established on a healthy footing.

The mode of keeping the accounts is not quite so clear as the Council would wish to see adopted, and they have requested the Secretary to re-model his Establishment with a view to introducing a better system. The Assistant Secretary's services might, the Council think, be made advantageously of use in seeing this reform carried out.

*Bye-laws.*—The revised Code of Bye-laws was passed by the Society on the 12th of March last, and has since been in successful operation. The modification of one of these Bye-laws has lately been suggested by the Council, and their proposal will have to be considered by the present meeting.

*Secretaries.*—Captain Hayes's resignation consequent on his leaving the Presidency was necessarily accepted on the 7th of May last, when Dr. Sprenger, an Oriental scholar of known and high attainments, was elected Secretary on the appointment generally of office-bearers under the revised Code.

*Journal.*—The number of Journals published during the year is seven. The Secretary has materials on hand for three more numbers, which will shortly appear.

*Oriental Publication Fund.*—The Cash balance in hand and invested on account of this Fund amounts to Rs. 6,808-13. During the year six numbers of the *Bibliotheca Indica* have been published including the number edited by the Rev. K. M. Bannerjea. The Report by the Oriental Sub-Committee on the mode of editing and issuing this publication referred to in the Annual Statement of the Committee for the past year, has been submitted during this year, and was adopted by this Society on the 5th November to the following effect.

“That whilst it is of the highest importance for translations to be made here in India with all Hindu assistance, it is not expedient to limit the publication of volumes in the *Bibliotheca Indica* to works which the Editors may be prepared at once to translate. It is evident that such a restriction would operate unfavourably, as in many cases years must be spent before a perfectly satisfactory translation would be finished.

*Museum.*—The Council have much satisfaction in renewing the testimony borne in last year's report to the services of the Curators of the Museum in both its departments.



*Library and Librarian.*—The number of works added to the Library during the year is 93. This department of the Institution has occupied the Council's serious attention, very much yet remains to be done both in the way of enriching its contents, and opening out and preserving the valuable books and MSS. already collected. Some slight advance towards this latter object has been made in the course of the year under report. It is proposed to devote the whole available surplus of the current year to these purposes. The Librarian's discharge of his duties continues to be most satisfactory.

(Signed) A. SPRENGER,  
*Secretary.*

In conformity to a notice given at the monthly meeting on the 3rd December last, the President on behalf of the Council, moved that the Rule No. 6 regarding the election of ordinary members be amended by striking out from it the words "eleven" and inserting *seven*.

The motion was seconded by Mr. Beadon, and carried *nem. con.*

The Meeting then proceeded to elect Office-bearers for the current year, and appointed Messrs. B. J. Colvin and C. Beadon as scrutineers who after examining the lists declared the following to be the result of the ballot.

Sir James Colville, *President.*

Sir H. M. Elliot,	}	<i>Vice-Presidents.</i>
Dr. O'Shaughnessy,		
W. Jackson, Esq.		

*Council.*

J. R. Colvin, Esq.

C. Beadon, Esq.

Capt. Thuillier.

A. Grote Esq.,

Rev. W. Kay.

Major Baker.

R. G. Ghose, Esq.

A. J. M. Mills, Esq.

S. G. T. Heatly, Esq.

H. Walker, Esq.

*Secretary.*

Dr. A. Sprenger.





Dr.

*Abstract Statement of Receipts and*

## RECEIPTS.

## To MUSEUM.

Received from the General Treasury, the Amount of Government allowance authorized by the Court of Directors for the services of a Curator, from December, 1850—to November, 1851, at 250 Rs. per mensem, .....	3,000	0	0	
Ditto for the preparation of Specimens of Natural History, from ditto to ditto at 50 Rs. per mensem, .....	600	0	0	
Received Fine from Chokeydar's Salary, .....	3	0	0	
				<u>3,603 0 0</u>

## To MUSEUM OF ECONOMIC GEOLOGY.

Ditto ditto Amount of Government allowance for the services of a joint Curator from December, 1850 to November, 1851, at 250 Rs. per mensem, .....	3,000	0	0	
Ditto for Establishment and Contingencies from December, 1850 to November, 1851, at 64 Rs. per mensem, .....	768	0	0	
				<u>3,768 0 0</u>

## To CONTRIBUTIONS AND ADMISSION FEES.

Received from Members Amount of Quarterly Contributions from January to December, 1851, .....	8,434	9	8	
Ditto ditto in advance, .....	20	10	9	
Ditto ditto by transfer, .....	128	0	0	
Ditto ditto admission Fees, .....	256	0	0	
				<u>8,839 4 5</u>

## To LIBRARY.

Received by Sale of Miscellaneous Books, .....	101	8	0	
Received Fine from Chokeydar's Salary, ..	3	0	0	
Received from Sekligar his services not having been entertained in the month of March, for 15 days, .....	1	0	0	
				<u>4 0 0</u>
				<u>105 8 0</u>

Carried over, 16,315 12 5





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*Proceedings of the Asiatic Society.*

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*Disbursements of the Asiatic Society, for the year 1851.*

Cr.

## DISBURSEMENTS.

## BY MUSEUM.

Paid Mr. E. Blyth's Salary as Curator from December, 1850 to November, 1851, being 12 months, at 250 Rs. per mensem, .....	3,000	0	0		
Ditto ditto house-rent from ditto to ditto being 12 months, at 40 Rs. per mensem, .....	480	0	0		
Ditto Establishment of Taxidermists from ditto to ditto, at 45-2-8 Rs. per mensem, .....	530	0	0		
Ditto for Contingencies incurred for the preparation of Specimens of Natural History from ditto to ditto, .....	233	3	3		
				4,243	3 3

## BY MUSEUM OF ECONOMIC GEOLOGY.

Ditto Mr. H. Piddington's Salary as joint Curator from December, 1850 to November, 1851, being 12 months, at 250 Rs. per mensem, .....	3,000	0	0		
Ditto Establishment from ditto to ditto, at 35 Rs. per mensem, .....	420	0	0		
Ditto for Contingencies from ditto to ditto, .....	155	5	3		
Ditto for a Copy of Bengal Directory of 1851, .....	8	0	0		
Ditto for a Copy of Rose's Chemical Analysis, 3 vols., .....	24	0	0		
Ditto for a Copy of William's Mineral Kingdom, .....	4	8	0		
Ditto for a Copy of Report of the Commissioners on Mines, folio, .....	10	0	0		
Ditto for a Copy of McCulloch's Geology, 2 vols. ..	5	0	0		
Ditto for a Copy of De la Beche's Geological Observer, .....	13	8	0		
Ditto for a Copy of Dana's Mineralogy, .....	16	0	0		
Ditto for a Copy of Progress of Chemistry, 5 Nos. ..	1	0	0		
				3,657	5 3

## BY MUSEUM OF MINERALOGY AND GEOLOGY.

Ditto Mr. H. Piddington, Curator for sundry contingencies, .....	17	10	6		
				17	10 6

## BY LIBRARY.

Ditto Babu Rajendralal Mitra's Salary as Assistant Secretary and Librarian from December, 1850 to November, 1851, being 12 months, at 70 Rs. per mensem, .....	840	0	0		
Ditto Establishment from ditto to ditto being 12 months, at 37 Rs. 8as. per mensem, .....	450	0	0		
Ditto Contingencies from ditto to ditto, .....	44	8	3		
Ditto Messrs. P. S. DeRozario and Co. for sundry Stationery, .....	23	4	0		
Ditto Radhanauth Dhur and Co. for ditto, .....	5	0	0		
Ditto Mr. R. S. Walker, Agent of the Peninsular and Oriental Steam Navigation Co., Charges for landing a Parcel from Bombay, .....	0	8	0		
Ditto Messrs. W. Thacker and Co. for purchase of Books, .....	93	4	0		
Carried over, .....	1,456	8	3	7,918	3 0





Brought forward, 16,315 12 5

**TO SALE OF ORIENTAL PUBLICATIONS.**

Received by Sale of Oriental works sold at the Library, and Subscriptions to the Bibliotheca Indica, .....	1,267	8	6	
	<hr/>			1,267 8 6

**TO SALE OF ORIENTAL PUBLICATIONS AT BENARES.**

Received from Major Kittoe, proceeds of Oriental works sold at Benares, .....	150	0	0	
	<hr/>			150 0 0

Carried over,	<hr/>	<hr/>	
	17,733	4	11





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	Brought forward,	1,456	8	3	7,918	3	0
Ditto Messrs. Scott and Co. for a Copy of Bengal Directory for 1851, .....		8	0	0			
Ditto Mr. Thomas Black for Lithographing 250 Copies of a letter of thanks, with paper, .....	15	0	0				
250 ditto of a Vignette of the Society from steel on the above at 6 Rs. per 100, .....	15	0	0				
		30	0	0			
Ditto Noorkhan for mounting and varnishing Maps, .....	5	0	0				
Ditto Messrs. R. C. Lepage and Co. for purchase of Books and landing charges, .....	39	12	0				
Ditto Messrs. Gladstone, Wyllie and Co. for Freight on a case of sundry Books despatched to Messrs. W. H. Allen and Co. of London for presentation to the Royal Academy of Munich, .....	10	0	0				
Ditto Hurryhur Banerjee for printing 500 Copies of Circular letter of thanks, .....	2	0	0				
Ditto Bussiruddin Bookseller for 2 vols. of Index to the Edinburgh Review, .....	5	0	0				
Ditto Duftery for binding Books, .....	195	2	0				
Ditto W. Anderson, Esq. Manager of the Oriental Bank for a set of Bills of Exchange for £ 31 10s. one day's Sight in favor of W. Neil, Esq. Collector of the Oriental Translation Fund, London, remitted to him on Account of Subscription, for the years 1849-50-51; exchange at 1-11 per Rupee, .....	328	11	0				
					2,080	1	3

## BY SALE OF ORIENTAL PUBLICATIONS AT BENARES.

Ditto Mr. M. G. Castello, Government Steam Department, Freight on a Parcel of Books despatched to Major M. Kittoe, Benares, for sale, .....	1	8	0				
					1	8	0

## BY MISCELLANEOUS.

Ditto F. Halligan's Salary as night-guard from December, 1850 to August, 1851, being 9 months, at 40 Rs. per mensem, .....	360	0	0				
Ditto M. McGrath's Salary as night-guard from September to November, 1851, being 3 months, at 40 Rs. per mensem, .....	120	0	0				
Ditto for advertizing Meeting of the Society in the Newspapers, .....	258	7	0				
Ditto Mr. J. Chaunce for winding up and keeping the Clock in Order, from May, 1850 to April, 1851, .....	25	0	0				
Ditto R. Ghose, Collector of Assessment for the Premises of the Asiatic Society, Park Street No. 45 from November, 1850 to July, 1851, .....	157	8	0				
Ditto sundry contingent Charges for the Meeting and Oil for the night-guard, .....	148	11	3				
Ditto Postage for Circular letters forwarded to the Mofussil Members for votes, .....	14	12	0				
Ditto Rev. J. Thomas, on account Baptist Mission Press, for printing Miscellaneous Papers, &c. ....	1,606	8	0				
Carried over,	2,690	14	3	9,999	12	3	





Brought forward, 16,315 12 5

## TO SALE OF ORIENTAL PUBLICATIONS.

Received by Sale of Oriental works sold at the Library, and Subscriptions to the Bibliotheca Indica, .....	1,267 8 6	1,267 8 6
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## TO SALE OF ORIENTAL PUBLICATIONS AT BENARES.

Received from Major Kittoe, proceeds of Oriental works sold at Benares, .....	150 0 0	150 0 0
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Carried over,	17,733 4 11
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Brought forward,	1,456	8	3	7,918	3	0
Ditto Messrs. Scott and Co. for a Copy of Bengal Directory for 1851, .....	8	0	0			
Ditto Mr. Thomas Black for Lithographing 250 Copies of a letter of thanks, with paper, .....	15	0	0			
250 ditto of a Vignette of the Society from steel on the above at 6 Rs. per 100, .....	15	0	0			
	30	0	0			
Ditto Noorkhan for mounting and varnishing Maps, .....	5	0	0			
Ditto Messrs. R. C. Lepage and Co. for purchase of Books and landing charges, .....	39	12	0			
Ditto Messrs. Gladstone, Wyllie and Co. for Freight on a case of sundry Books despatched to Messrs. W. H. Allen and Co. of London for presentation to the Royal Academy of Munich, .....	10	0	0			
Ditto Hurryhur Banerjee for printing 500 Copies of Circular letter of thanks, .....	2	0	0			
Ditto Bussiruddin Bookseller for 2 vols. of Index to the Edinburgh Review, .....	5	0	0			
Ditto Duftery for binding Books, .....	195	2	0			
Ditto W. Anderson, Esq. Manager of the Oriental Bank for a set of Bills of Exchange for £ 31 10s. one day's Sight in favor of W. Neil, Esq. Collector of the Oriental Translation Fund, London, remitted to him on Account of Subscription, for the years 1849-50-51; exchange at 1-11 per Rupee, .....	328	11	0			
				2,080	1	3

## BY SALE OF ORIENTAL PUBLICATIONS AT BENARES.

Ditto Mr. M. G. Castello, Government Steam Department, Freight on a Parcel of Books despatched to Major M. Kittoe, Benares, for sale, .....	1	8	0			
				1	8	0

## BY MISCELLANEOUS.

Ditto F. Halligan's Salary as night-guard from December, 1850 to August, 1851, being 9 months, at 40 Rs. per mensem, .....	360	0	0			
Ditto M. McGrath's Salary as night-guard from September to November, 1851, being 3 months, at 40 Rs. per mensem, .....	120	0	0			
Ditto for advertizing Meeting of the Society in the Newspapers, .....	258	7	0			
Ditto Mr. J. Chaunce for winding up and keeping the Clock in Order, from May, 1850 to April, 1851, .....	25	0	0			
Ditto R. Ghose, Collector of Assessment for the Premises of the Asiatic Society, Park Street No. 45 from November, 1850 to July, 1851, .....	157	8	0			
Ditto sundry contingent Charges for the Meeting and Oil for the night-guard, .....	148	11	3			
Ditto Postage for Circular letters forwarded to the Mofussil Members for votes, .....	14	12	0			
Ditto Rev. J. Thomas, on account Baptist Mission Press, for printing Miscellaneous Papers, &c. ....	1,606	8	0			
Carried over,	2,690	14	3	9,999	12	3





Brought forward, 17,733 4 11

## TO JOURNAL.

Received by Sale of the Society's Journals and from

Subscriptions to the Journal, .....	1,222	0	0	
	<hr/>			1,222 0 0

Carried over,	18,955	4	11
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	Brought over,	2,690	14	3	9,999	12	3
Ditto Messrs. Augier and Co. for repairing a Circular Argand lamp, .....		3	0	0			
Ditto Harranchunder Surcar for Lithographing 1000 Copies of Contribution Bills, at 1-8 per 100, ....		15	0	0			
Ditto Secretary to the India General Steam Navigation Co. Freight on a Parcel despatched per Steamer Assam, to Mr. Balfour, .....		2	0	0			
Ditto Charges for landing a case from Ship "Paradise,"		0	9	3			
					2,711	7	6

**BY JOURNAL.**

Ditto Rev. J. Thomas, on account Baptist Mission Press, for printing the Society's Journal from September to December, 1849, and No. 1 to 7 of 1850, .....	2,610	0	0				
In part of No. 1 of 1851, .....	180	0	0				
				2,790	0	0	
Ditto Mr. Thomas Black, proprietor of the Asiatic Lithographic Press for Lithographing Plates, &c...	41	5	0				
Ditto for Freight for Journals forwarded to Messrs. W. H. Allen and Co. of London, per P. O. S. N. Co.'s Steamer, .....	144	6	0				
Ditto Madhabchunder Mookerjee for Colouring 249 Copies of Plates, at 7-8 per 100, .....	18	10	9				
Ditto Modosuden Doss Draftsman for Extra work, ..	56	8	0				
Ditto Horeemohun Doss for Colouring Plates of Fishes,	7	0	0				
Ditto Abdool Haleem for Copying Maps, &c. ....	68	0	0				
Ditto Mr. G. H. Stapleton for Lithographing papers, &c.....	201	2	0				
Ditto Messrs Gladstone, Wyllie and Co. for Freight on a Case of Journals despatched to Messrs. W. H. Allen and Co. of London, .....	10	0	0				
Ditto Contingencies and Postage, .....	46	6	0				
				3,383	5	9	

**BY SECRETARY'S OFFICE.**

Ditto Establishment from December, 1850 to November, 1851, .....	718	0	0				
Ditto for Stationery, .....	14	6	6				
Ditto for Account Books, .....	6	2	0				
Ditto Extra Writer and Surcar for Collecting Bills, ..	36	2	0				
Ditto for Contingencies and Postage, .....	73	6	0				
				848	0	6	

**BY BUILDING.**

Ditto Mr. Crow, Builder, for Masonry work done by him, .....	39	7	0				
				39	7	0	

**BY H. TORRENS.**

Ditto him by transfer in part payment of Rs. 870, due to him by the Society on the 31st December, 1850,	64	0	0				
				64	0	0	

**BY J. MUIR.**

Ditto him by transfer in part payment of Rs. 159-14, due to him by the Society on the 31st December, 1850,	114	2	0				
				114	2	0	

Carried over, 17,160 3 0





Brought over, 18,955 4 11

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18,955 4 11

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TO BALANCE.

As per Account closed on the 31st December, 1850, ..... 1,711 7 2

Co.'s Rs. 

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20,666 12 1

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Brought over, 17,160 3 0

BY J. W. LAIDLAY.

Ditto him by transfer in part payment of Rs. 443-7-4,  
due to him by the Society on the 31st December,  
1850, .....

25 0 0

25 0 0

17,185 3 0

BY BALANCE.

In the Bank of Bengal, ..... 3,059 4 5  
Ditto on Account of the Journal, .... 108 12 4  
Cash in hand, ..... 67 2 1

3,235 2 10

BY INEFFICIENT BALANCE.

For Balance of the Amount advanced to  
Mr. E. Blyth, Curator, for Contingencies in the Museum and Zoology  
Department, for the month of November and December, as per Receipt, 144 3 6  
Ditto ditto advanced to Babu Rajendra  
Lall Mittra, Librarian and Assistant  
Secretary, for Contingencies in the  
Library, for November and December,  
as per Receipt, ..... 32 2 9  
Amount advanced to Ramdhone Mistry  
for Book-cases in the English Library, 70 0 0

246 6 3

3,481 9 1

Co.'s Rs..... 20,666 12 1

E. E.

(Signed)

CALLY-CHARAN NANDY,  
Offg. Accountant.





Dr.

*The Oriental Publication Fund in*

January 20th, 1851.—To Cash paid Establishment for the Custody of Oriental Works for December, 1850,	42	0	0	
Ditto Sariatullah Duftory for binding books as per bill,	41	0	0	
Ditto 31st. Ditto Babu Rajendra Lall Mittra, Librarian, for sundry Contingencies for December last,...	7	9	0	
				90 9 0
February 19th. Ditto for sundry Contingencies for January last as per bill, .....	2	3	0	
Ditto Establishment for the Custody of Oriental Works, for January last, .....	42	0	0	
Ditto Dr. E. Röer, Editor of the Oriental Journal, Bibliotheca Indica, his Salary for December 1850 and January last, .....	200	0	0	
Ditto ditto, Establishment for ditto, .....	78	0	0	
Ditto ditto, Contingencies for ditto, .....	47	12	6	
Ditto 21st ditto, Sariatullah Duftory for binding books as per bill,.....	8	0	0	
				377 15 6
March 24th, Ditto Establishment for the Custody of Oriental Works for February last, .....	42	0	0	
Ditto 26th, Ditto Dr. E. Röer, Editor of the Oriental Journal Bibliotheca Indica, his Salary for February last, .....	100	0	0	
Ditto ditto, Establishment for ditto, .....	35	0	0	
Ditto ditto, Contingent for ditto, .....	26	6	0	
				203 6 0
April 7th, Ditto Babu Rajendra Lall Mittra, Librarian, for sundry Contingencies for February and March last, .....	2	8	0	
Ditto 25th, ditto Dr. E. Röer, Editor of the Oriental Journal Bibliotheca Indica, his Salary for March last, .....	100	0	0	
Ditto ditto, Establishment for ditto, .....	35	0	0	
Ditto ditto, Contingent for ditto, .....	27	11	6	
Ditto Cash paid Establishment for the Custody of Oriental Works for March last, .....	42	0	0	
Ditto 26th, ditto Rev. J. Thomas, for printing and paper, 500 Copies of Bibliotheca Indica, Nos. 29 and 30 as per bill, .....	444	0	0	
				651 3 6
May 10th, ditto Babu Rajendra Lall Mittra, Librarian, for sundry Contingencies for April last,.....	1	0	0	
Ditto 16th, ditto Establishment for the Custody of Oriental Works for April last,.....	42	0	0	
Ditto 17th, ditto ditto Dr. E. Röer, Editor of the Oriental Journal Bibliotheca Indica, his Salary for April last, .....	100	0	0	
Ditto ditto, Establishment for ditto, .....	35	0	0	
Ditto ditto, Contingencies for ditto, .....	26	10	6	
Ditto 22nd ditto Moe-e-uden Ahmud Book-seller for a Copy of Tafsir Ahmudin, .....	8	0	0	
				212 10 6
Carried over,	1535	12	6	



*Account Current with the Asiatic Society.*

Cr.

January 1st 1851.—By Balance of account closed and published down to the 31st December 1850.

Company's Papers of the new 5 per Cent. Loan deposited with the Government Agent, .....	5,500	0	0		
Cash in the Bank of Bengal, .....	554	2	9		
Cash in hand, .....	32	7	6		
				6,086	10 3
Ditto 22nd, by Cash received from the General Treasury being the monthly grant sanctioned by the Court of Directors for the month of December 1850, .....	500	0	0	500	0 0
February 17th, ditto ditto for January last, .....	500	0	0	500	0 0
March 24th, ditto ditto for February 1851, .....	500	0	0	500	0 0
April 22nd, ditto ditto for March 1851, .....	500	0	0	500	0 0
May 20th, ditto ditto for April 1851, .....	500	0	0	500	0 0
June 19th, ditto ditto for May 1851, .....	500	0	0	500	0 0
July 18th, ditto ditto for June 1851, .....	500	0	0	500	0 0
August 15th, ditto ditto for July 1851, .....	500	0	0	500	0 0
September 19th, ditto ditto for August 1851, .....	500	0	0	500	0 0
October 29th, ditto ditto for September 1851, .....	500	0	0	500	0 0
November 19th, ditto ditto for October 1851, ..	500	0	0	500	0 0
December 23rd, ditto ditto for November 1851, ....	500	0	0	500	0 0

Carried over, Co.'s Rs. 12,086 10 3





	Brought forward,	1,535	12	6	
June 11th, ditto Establishment for the Custody of Oriental Works for May last, .....	42	0	0		
Ditto 14th, ditto Essurchunder Sarmana, Pundit for Babu Rajendra Lall Mittra, Librarian, his Salary for May last, .....	20	0	0		
Ditto 17th, ditto Dr. E. Röer Editor of the Oriental Journal Bibliotheca Indica, his Salary for May last, .....	100	0	0		
Ditto, ditto Establishment for ditto, .....	35	0	0		
Ditto, ditto Contingent for ditto, .....	26	0	0		
				223	0 0
July 2nd, ditto W. Anderson, Esq., Manager of the Oriental Bank, for a set of Bills £40 at one day Sight at the rate of exchange 1-11½ per Rupee to be remitted to Mr. F. Dummmler, Berlin, subscription for 20 Copies each of Nos. 1 and 2 of Dr. Weber's Yajur Veda, .....	408	8	3		
Ditto 8th, Cash paid Establishment for the Custody of Oriental Works for June last, .....	42	0	0		
Ditto 15th, ditto Essurchunder Sarmana, Pundit for Babu Rajendra Lall Mittra, Librarian, his Salary for June last, .....	20	0	0		
Ditto 26th, ditto Dr. E. Röer, Editor of the Oriental Journal Bibliotheca Indica, his Salary for June last, .....	100	0	0		
Ditto, ditto Establishment for ditto, .....	25	0	0		
Ditto, ditto Contingent for ditto, .....	24	3	0		
Ditto 28th, ditto, Rev. J. Thomas, Baptist Mission Press, for printing and paper for 500 Copies of Bibliotheca Indica, Nos. 31, 32, 33, 34, 35, as per bill,..	1,518	6	0		
				2,138	1 3
August 13th, ditto Establishment for the Custody of Oriental Works for July last, .....	42	0	0		
Ditto 14th, ditto Dr. E. Röer, Editor of the Oriental Journal Bibliotheca Indica, his Salary for July last, .....	100	0	0		
Ditto, ditto Establishment for ditto, .....	25	0	0		
Ditto, ditto Contingent for ditto, .....	21	5	3		
Ditto, 15th, ditto Essurchunder Sarmana, Pundit for Babu Rajendra Lall Mittra, Librarian, for July last, .....	20	0	0		
Ditto 30th, ditto Babu Rajendra Lall Mittra, Librarian, for sundry Contingencies for June last, .....	1	13	0		
				210	2 3
September 12th, ditto Sariatullah Duftory for binding books, as per bill, .....	29	0	0		
Ditto Dr. E. Röer, Editor of the Oriental Journal Bibliotheca Indica, his Salary for August last, ....	100	0	0		
Ditto, ditto Establishment for ditto, .....	35	0	0		
Ditto ditto, Contingent for ditto, .....	26	0	0		
Ditto 15th, Cash paid Essurchunder Sarmana, Pundit for Babu Rajendra Lall Mittra, Librarian, his Salary for August last, .....	20	0	0		
Ditto 16th, ditto Establishment for the Custody of Oriental Works for August last, .....	42	0	0		
Ditto 24th, ditto Babu Rajendra Lall Mittra, Librarian, for sundry Contingencies for August last, .....	1	1	9		
Carried over,	253	1	9	4,107	0 0





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Brought forward, 12,086 10 3

Carried over, 12,086 10 3





	Brought forward,	253	1	9	4,107	0	0
Ditto 26th, ditto Establishment for the Custody of Oriental Works for September, .....		42	0	0			
Ditto 27th, ditto Essurchunder Sarmana, Pundit for Babu Rajendra Lall Mittra, Librarian, his Salary for September last, .....		20	0	0			
					315	1	9
October 27th, ditto Dr. E. Röer, Editor of the Oriental Journal Bibliotheca Indica, his Salary for September last, .....		100	0	0			
Ditto ditto Establishment for ditto, .....		35	0	0			
Ditto ditto Contingent for ditto, .....		23	8	0			
					158	8	0
November 8th, ditto ditto Establishment for the Custody of Oriental Works for October last, .....		42	0	0			
Ditto 18th, ditto Essurchunder Sarmana, Pundit for Babu Rajendra Lall Mittra, Librarian, his Salary for October last, .....		20	0	0			
Ditto 19th, ditto Dr. E. Röer, Editor of the Oriental Journal Bibliotheca Indica, his Salary for October last, .....		100	0	0			
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# JOURNAL

OF THE

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No. II.—1852.

*On the Connection of the Dative and Accusative cases in Bengali and Hindustani.—By the Rev. W. KAY, Principal of Bishop's College.*

While the comparative investigation of grammatical forms has engaged the attention of many learned men in Europe, (it is hardly necessary to mention Bopp in particular) there is a wide field for philological speculation yet (so far as I am aware) unexplored in the comparison and explanation of grammatical laws and constructions. This last higher and more interesting inquiry pre-supposes the first, but forms its necessary complement.

It is as far from the purpose of the writer of the present sketch, as it is from his ability, to supply this desideratum. But as the subject referred to in the heading is not uninteresting in itself, and the discussion may rouse the activity of minds better qualified to take up the work, it is thought a few brief remarks, *pour servir*, may not be out of place in this journal.

I. *What are the facts of the case?*

In Dr. Yates's Bengali Grammar we are told "The dative case is usually made by কৈ, like the objective;" and afterwards in the syntax "verbs of giving and communicating to, govern the dative case, which however most commonly has the same form as the objective."

In Sama Churn Sircar's Grammar we have a more detailed statement, to the effect that only personal nouns have the termination কৈ



in the accusative, whilst nouns denoting inanimate objects are not inflected in the accusative.

He also remarks that in conversational and poetical phraseology there is a different termination for the accusative, which is also common to the dative (thus we may say আমারে দেও, as well as আমারে দেখ.)

The Hindustáni grammars give the following form for the declension of nouns.

Dat. رای کو    Acc. رای }  
رای کو

Forbes's Grammar, after stating that the accusative case is in Hindustáni, as in English, generally like the nominative, adds, "but when it is desirable to render the object of an active verb *very definite or specific*, then the termination ko (of the dative) is added to the object."

## II. *Inferences.*

(1) The parallelism of the above facts, as well as the similarity of the forms کو and کو, naturally suggests that the Bengáli and Hindustáni suffixes have a common origin; and therefore that whatever explanation is given, in the one language, of the circumstance that the same termination is employed to denote both dative and accusative, will apply also to the other.

(2) As the suffix کو is never absent from the dative, though it is frequently from the accusative; we seem warranted in concluding that the dative has the prior claim to it. To suppose the reverse would imply the entire want of a dative in the original language.

(3) Unless then we are prepared to show that the کو of the dative and accusative were originally different and have only converged accidentally into their present identical form, (of which no evidence, however, exists) we must conclude that the accusative proper is the same in form with the nominative.

So indeed it has been (in varying degrees), in many languages.

Thus in the Greek, Latin, and German, the nominative and accusative of all neuter nouns are the same.\*

\* A fact ingeniously interpreted by Coleridge to mean that strictly speaking such nouns have *no nominative*. "The reason is, a *thing* has no subjectivity, or nominative case; it exists only as an *object*, in the accusative case."



In English, and most modern European languages, all nouns have the same form in the nominative and accusative.

In Turkish the accusative is identical with the nominative, when it is *indefinite* and immediately precedes the verb.\*

In Hebrew the two cases are the same, except that defined nouns (i. e. nouns with the article, or in construction) are frequently preceded by *ל*.

In Armenian† exactly the same holds; the nominative and accusative coincide except that *za* is prefixed to *defined* nouns.

### III. *Specific analogies.*

The above inferences, drawn from the facts of the case, and supported in part by the general analogy of other languages, are still liable to the charge (which it is so hard to rebut) of theorizing. But fortunately we have some more special analogies to present in confirmation of what has been said. For

(1) In the Persian, we find, that when the noun is *indefinite*, the accusative coincides with the nominative; but that if the noun be *defined*, *ی* is suffixed, this *ی* being *also used to express the dative*.

(2) In the Syriac, the dative and accusative have a prefixed *ܝ* (= Engl. *to*) as their common characteristic. Now this *ܝ* may be dropped in the accusative, especially if the noun is indefinite, but cannot in the dative.‡

(3) In the Spanish, when the object of a verb denotes *a person*, it is regularly preceded by the preposition *á*, i. e. by the common sign of the dative.§

Now (whatever may be said of the Persian), there can, at least in the two last instances, be no question about the accusative form's being borrowed from the dative.

### IV. The *rationale* of this inferred fact.

On the hypothesis of the termination's belonging properly to the

\* Kazim-Beg's "Turkish-Tatar Grammar."

† Petermann's Arm. Gr. "Accusativi forma à formâ nominativi diversa non est, &c."

‡ Uhlemann, Syr. Sprach-Lehre: § 75.

§ *Him, whom, and them*, were originally datives. See Dr. Latham "On the English Language."



accusative, no explanation can be given of its being transferred to the dative. Indeed such a transference would be contrary to all analogy.\*

But on the converse hypothesis we *can* explain how the dative came to be used in an objective sense.

The action of a verb may be direct or indirect. Some verbs denote an action which operates immediately upon an object, implying a transmission of power from the agent upon it, (e. g. striking, burning, teaching, &c.) In all these the objective is employed. But there are other verbs where the action is not direct or immediate, which, in fact, imply little more than that the subject and object are connected or occupy a certain relation to each other: (e. g. pleasing, consenting, trusting, &c.) In this latter case the dative might easily come to be thought the more appropriate for designating the object.† Such is, actually the case in Latin, Greek, Anglo-Saxon, German, French, and Turkish. The usage once introduced would have a tendency to spread, wherever the object of the verb was to be brought prominently into notice, not merely as an object, but as a *recipient*; until at last the dative in some languages might come to be looked upon as an actual form of the accusative.

This explanation agrees with what, we have seen, prevails very extensively in the languages above-cited, viz. that the nouns to which the dative sign is attached in the accusative sense are chiefly *personal* nouns; for *things* are simply objects of an action rather than recipients of influence, *persons* are recipients rather than simply objects.

And there is another point to be noted. In languages like the Hindustáni and Bengáli where both the nominative and the objective *precede* the verb, some expedient would be found necessary to prevent confusion as to which was the agent and which the object. But

\* The only instance that occurs to me, as possibly furnishing an exception, is that of the French pronouns *me*, *te*, *se*. e. g. Il *me* donne. But I believe that in such examples the *me* is only a shortened form of the dative *moi*, when deprived of the accent. At any rate when the accent returns the longer form recurs; as in *Donnez-moi*.

We may remark that this very *moi* furnishes an example of the dative used to give strong *objectivity* to the personal idea: as in "Voudriez-vous *me* perdre, *moi*, votre allié?"

† 'Thanking' or 'praising,' &c. being = 'giving thanks' and 'bestowing praise,' &c.



as inanimate things are comparatively seldom introduced as agents, the necessity for calling in the aid of a particle to signify that they were *not* agents, but *objects*, would be felt chiefly in nouns denoting persons.\*

V. *The etymological relations of the dative particle.*

It may not be without its weight to observe that the other Bengálí form for the dative and accusative (এতর) closely resembles the common genitive (এর). Now the dative is very nearly connected (on two different aspects) with *both* the genitive and the accusative. Grant the dative, then, as the intermediate starting point, and one can understand how the forms for the genitive and the accusative may approximate: but not otherwise.

Precisely the same will apply to the other terminations কে and کو, when compared with the Hindustáni genitive ك. We can understand the similarity of is-ko to is-ka, if ko be the original property of the dative, but not if it be a true accusative termination.

And now let us conclude with a conjecture; is not this termination the same with that which *universally marks the dative in the Tatar languages*? "The characteristic ending of the dative in the Tatar dialects generally is ك or ك ka or ke:—changed after a vowel or hard consonant into غا or غه gha or ghe" (*Kazim Beg, u. s.*) If so, may we not further infer that the basis of the Hindi-speaking races is not Indo-Germanic, but Mongolian?"

*Foreign words occurring in the Qorán, by A. SPRENGER, M. D.*

It is an unexpected and interesting fact that there occurs a foreign word in the first Súrah of the Qorán. The word sirát صراط we are told by Soyúty is Rúmee, i. e. Latin! and we have no difficulty in ascertaining from what term it is derived, we recognise at once in it the word *strata* (via) which has been preserved in the same

\* To the same cause we may refer the use of ني to designate the *agent* case. On the other hand the logical character of the arrangement of our nominative verb and object in English, is what enables us so readily to dispense with noun-inflections.



meaning which it has in Arabic—road—in almost every European language, in English we have street, in Dutch straat, German strasse, Italian strada, &c. The omission of the first *l* will not surprise those who are acquainted with the genius of the Arabic language. It has a tendency to make words tri-consonantal as I have shown at some length in my paper on the Physiology of the Arabic language. Nor does the orthography militate against the opinion of Soyúty, though De Sacy says the *ص* and *ط* are never used in writing foreign words. De Sacy is wrong. Comes is spelt قمص, Cæsar is spelt قيصر, Stephanus is spelt استيفان, στυπειον is spelt اصطبة, Aristotle is spelt ارسطو. There can therefore be no doubt but Sirát is a Latin word. But what may have been the reason for using a foreign word for expressing an idea for which the Arabic language had several terms?—Sirát has always a mystical sense in the Qorân, meaning religion, road to heaven, and it is likely that the same word was used by the Christians of Syria for expressing this idea.

I have an Arabic Manuscript entitled رسالة مهذبة في الالفاظ المعربة by Soyúty containing a list of the foreign words which occur in the Qorân. This list is also in the 38th chapter of his *Itqán fy 'olúm alqorân* by the same author which is being edited. It contains most of the words which the Arabs themselves consider of foreign origin, and only so far Soyúty's opinion can be of value, for his derivations from other tongues which neither he knew nor those whose authority he quotes, are very unsatisfactory. I did not think proper to swell this article by an attempt to supply this defect, but leave these investigations to others.

ابارىق abáryq Súrah 56, 18. Persian, the paasage of water, a channel, an ewer.

اب abb, Súrah 80, 31. Grass.

ابلي abla'y 11, 46. Hebrew or Abyssinian, to absorb.

اخلد akhlad 7, 175. Hebrew, to rest upon.

الارايك aráyik 83, 23. Abyssinian, couches.

الاسباط asbát, *passim*. Hebr. tribes.

استبرق istabraq 76, 21. 55, 54. 18, 30. 44, 53. Pers. coarse brocade.

اسفار asfár, *passim*. Syriac and Nabatean (i. e. Chaldean), books.

اىصر iṣr 3, 75. Nabatean (i. e. Chaldean), compact.



اكواب akwáb 88, 14, 56, 18. Nabatean, a water-pot.

ال ill, 9, 8. Nabatean or Hebrew, God. (This is the explanation of Soyúty but from the contents it would appear that *ill* means treaty in the Qorân and it is used in that sense by Notanabby in a former rhyming with ذمة)

أليم alym, *passim*. Zinjian or Hebrew, pain.

اواه awwáh 11, 77. Abyssinian, trusty (múqin) kind-hearted.

اواب awwáb 50, 31. Abyssin. a name for Christ.

اوبي awwiby 34, 10. Abyssin. praise God!

الاولي والاخرة úlá means usually in the Qorân this world but in 33, 33, it means the other world in conformity with a Coptic idiom. The Copts call this world ákhirah and the other world úlá.

بطائن batáyin 35, 54. Coptic, the garment or brocade which they put on over another dress.

بعير ba'yr, *passim*. Hebrew, any animal of burthen.

بيع biya' 22, 41. Persian, church.

تذبير tatbyr 17, 7. Nabat. to slaughter.

تحت taht 19, 24. Nabat. belly, inside.

تذور tannúr 11, 42. Pers. oven.

الجبت jibt 4, 54. Abyssin. devil, sorcerer.

الطاغوت Tághút 4, 54 and *passim*. Abyssin. soothsayer.

حصب Haçab 21, 98. Zinjian, wood,—it is said that is a word used by the believers in Scriptures only, and not known to the Arabs.

حوب Húb 4, 2. Abyssin. a great sin.

الحواريون Hawáryyún, *passim*. Copt. fullers, washermen.

درست darasta 6, 105, Hebrew; thou hast read.

دري dorryy 24, 35. Abyssin. shining.

ديدار dynár 3, 68. Persian.

راعنا rá'iná 2, 98. Hebrew, is a term of abuse.

رانيون rabbányyún, *passim*. Hebrew or Syriac, a rabbin.

ربيون ribbyyún 3, 140. Syr. rabbins.

الرحمن rahmán, *passim*, Hebrew: merciful, originally spelled الرحمن

رس rass 25, 40, 'ajamy, a well.

رقيم raqym 18, 8. Rúmy (Greek?) tablet, or book, or according to others, inkstand.

رهو rahw 46, 23. Nabatean, easy; according to others, Syriac, secure, comfortable.



زنجبیل zanjabył 76, 17. Some say it is a Persian word, a spring in Paradise.

سجد sojjad, *passim*. Syriac, covering the head and face.

سجل sijill 21, 104. Pers. book, according to others Abyssin. man.

سجیل sijjyl 105, 4. Pers. compound of *sang*, stone, and *gil*, earth.

سرادق sorádiq 18, 28. Pers. the word is originally spelled *sarú-dar*, house door, and it means threshold, others say it is derived from *sarú-pardah*, the curtain of the house.

سریا saryyá 19, 24. Syr. or Nab. or Greek, river.

سفرة safarah 80, 15. Nabat. readers (of a sacred book).

سقر saqar, *passim* 'ajamy, (i. e. foreign) hell-fire.

سكر sakar 16, 69. Abyssin. vinegar.

سلسبیل salsabył 76, 18, is an 'ajamy (foreign) word.

سندس sondos 18, 30. Pers. and according to others Indian; fine brocade.

سیدھا sayyid 12, 25, husband—is not an Arabic word, some say it is Coptic.

سینا sayná 23, 20. Nabat. hill, and according to the *Itqán* it means beautiful.

شطر shatr 2, 139 and 145 and 146. Abyssinian, towards, opposite.

شهر shahr, *passim*. Syriac.

صراط çirát, *passim*. Rúmy, road, (in a mystical sense).

صر çor (from çawr) 2, 262. Nabat. to cleave, to cut.

صلوات çalát or çolút, or çilwat, or çalawat, or çolwat 22, 41. and *passim*. Hebrew and Syriac, Synagogues, the word is originally spelt صلوات

طه Tah 20, 1. Abyssin. and Nabat. O man, according to the *Itqán* it means O Mohammad!

طفق Tafaq 7, 12. Rúmy: to intend (it is explained by قصد قصد)

طوبی túbá 13, 28. Abyssin. a name of Paradise. According to some túbá طوبا (with alif) is Syriac or Nabat. and means a hill. In the

*Itqán* it is stated that it is an Indian word.

انیا iná 33, 53. Berber, looking.

انیه anyyah 88, 5. Hot, boiling.

الجهنم jahannam, *passim*. Hebr. or Persian, hell, derived from گهنام گهنام

حرم means وجب in the Abyssinian language.



- رمز ramz 3, 36. Hebrew, motion of the lips.  
 سحجين sijjyn 83, 7 and 8. is not an Arabic word.  
 سينين synyn 95, 2. Abyssinian, beautiful.  
 طوى towá 20, 12. Hebrew, man, some say it means at night.  
 عبادت 'abbadta 26, 21. Nabat. thou hast killed.  
 عدن 'adn, *pass.* Syriac, grape.  
 عرم 'arim 34, 15. Abyss. channels in which the water collects and dries up.  
 غسق ghassáq 38, 57. Turkey, cold stinking water—some say it is a word of Tokharistan.  
 غيض ghydh 11, 46. Abyss. the water has decreased.  
 فردوس firdaws 23, 11. Rúmy, a garden (it is evidently derived from Paradise) in Nabatean firdásá means grapes. Some say firdaws means a vineyard in Syriac.  
 فوم fúm 2, 58. Hebr. wheat.  
 قراطيس qarátys 6, 91 is not Arabic.  
 قسط qist, *passim.* Rúmy, justice.  
 قسطام qostás 17, 37. Rúmy, a balance, justice.  
 قسورة qaswarah 74, 51. Abyss. lion.  
 قسيس qissys 5, 85. ● Hebrew, a sincere friend (çiddyq).  
 قسيه qásiyah 9, 16, 'ajamy, a man with a bad heart, base coin.  
 قط qitt 38, 15. Nabat. a letter or document, a book.  
 قفل qofl 47, 26, is a Persian word, a lock.  
 قمل qommal 7, 130. Hebrew and Syriac, louse, insect.  
 قنطار qintár 3, 68. Rúmy, twelve ounces, some say it means in Syriac, filling a bull's skin with gold and silver. Some say it means in the Berber language one thousand mithqáls. Ibn Qotaybah says it means in the language of Africa Provincia 8000 mithqáls.  
 قيوم qayyúm, *passim.* Syriac, wide awake, a person who does not sleep.  
 كافور Kápúr, Pers. camphor.  
 كفر kaffara 47, 2. Hebrew or Nabat. he forgave their sins.  
 كفلان kiflân 57, 28. Abyss. double, in Nabat, two shares.  
 كنز kanz, *passim.* Persian, a treasure.  
 كورث kúwirat 81, 1. Pers. (probably from Kór blind.)  
 لينه lynah 59, 5, in the language of the Jews of Madynah, a date tree.



- متكأ mottakáän 12, 31. Abyss. and Coptic, lemon.
- مرجان marján 55, 22, a foreign word.
- مرقوم marqúm 83, 9. Hebr. written.
- مزجة mozját 12, 88, an 'ajamy word, some say it is a Coptic word, and means little.
- مسك misk 83, 26. Pers.
- مشكوة mishkát 4, 35. Abyss. a lantern (الكوة الكوة).
- مقاليد maqályd 39, 63. Persian, a key.
- ملكوت malakút, *passim*, is spelt in Nabatean ملكوت and means kingdom.
- مناص manác 38, 2. Nabat. taking flight.
- منساة minsaäh 34, 13. Abyss. a stick.
- منقطر monfatir 73, 18. Abyssin. filled.
- مهل mohl 18, 28. Maghriby or Berber word.
- ناشية náshiyah 73, 6. Abyssin. to get up (at night).
- هدنا hodná (from hawd) 7, 155. Hebrew, we repented our sins.
- هود Húd, ajamy instead of Yahúd or Júda.
- هون hawn 25, 64. Syriac or Hebrew.
- هيت لك hayta laka 12, 23. Coptic, come! in Syriac it means against thee or it is thy duty. In Hebrew it is هيتلك
- ورا wará 18, 78. Nabat. in front.
- وردة wirdah 55, 37, is not Arabic.
- وز wizr, *passim*. Nabat. mountain, place of refuge, in the Himyarit dialect it means also mountain.
- ياقوت yáqút, *passim*. Persian, a ruby.
- بحور hawr 84, 14. Abyssin. to return.
- يأس yásyn 36, 1. Abyssin. man, O man!
- يصدون has the same meaning in the Abyssinian language as يصدون in Arabic.
- صحر çahr 22, 21, a Maghriby word.
- اليم yamm, *passim*. Hebrew, Nabat. and Syriac, sea.



*Note on Col. Stacey's Ghazni Coins, by E. THOMAS, Esq. C. S.*

In the year 1848 the Royal Asiatic Society of London, did me the honour of publishing in their Journal my Essay on "The Coins of the Kings of Ghazni," which had for its object the exhibition of a classified Catalogue of this particular section of Mr. Masson's most successful Numismatic gleanings in Afghánistán. Col. Stacey's collection\* of Ghaznaví money, about to be described, will be found to furnish several supplementary dates and many unique and interesting additions to the general series, and as I have endeavoured to make this notice

\* In lately passing through Cawnpore I had an opportunity of cursorily examining the late Col. Stacey's extensive collection of Coins, and by the kind permission of the present owner, Captain Wroughton, I was enabled to secure this series for publication.

Apart from the historical interest and typical novelty of many of the specimens thus entrusted to me, I am anxious to make known the contents of this division of Col. Stacey's Cabinet as a fair sample of the entire collection, as I am desirous of seeing these Numismatic Treasures promoted into some locality more accessible to Oriental Antiquaries, than they at present occupy in a private Cabinet in an out of the way station in the N. W. Provinces.

An opportunity of effecting this occurs at the present moment, as the whole collection is now for sale, and it is offered on the very equitable terms that the price shall be determined by any third party, being a competent judge of these antiquities, who may be elected by the intending purchaser and approved of by the seller!

A general idea of the extent and character of the collection may be formed from the following classified outline of its contents.

	Gold.	Silver.	Copper.
Greek and Bactrian,.....	..	137	251
Indo-Scythian,.....	11	10	445
Arsakian,.....	..	27	54
Sassanian,.....	..	50	84
Old Hindu,.....	..	375	487
Gupta and Saurashtran,.....	18	29	4
Rahtors of Kanouj,.....	15	2	2
Kabul and Kashmir,.....	2	55	875
Khalifat, Ghazni, &c.,.....	57	677	1399
Grand Total,...	103	1362	3601



so far complete in itself, by inserting full transcripts of the legends and engravings of specimens of the leading classes, I trust it will prove an acceptable contribution to the Journal of the Asiatic Society of Bengal, whose pages, I may remark, as yet bear no record of the coinage of the first Moslem Dynasty of Zábulistán.

I prefix a Table shewing the order of succession of the Ghaznaví Sultáns, together with a summary of the dates of accession of those contemporaneous Potentates whose names find a place on their medals.

*A Table of the Ghaznaví Dynasty, &c.*

Khalífs of Baghdád.	Dates of accession.			Kings of Ghazni.	Accessions.	Sámání Emperors.
	A.H.	A.H.	A.D.		AH.	
Al Mutí'h lillah, . . . . .	334	350	961	Alptegín, . .	350	Mansúr bin Nóh I.
Al Táí'h lillah, . . . . .	363	366	976	Ishak, . . . .	366	Nóh bin Mansúr.
		367	977	Subuktigín,		
Al Káder billah, . . . . .	381	387	997	Ismáíl, . . . .	387	Mansúr bin Nóh II.
		388	998	Máhmúd, . .	389	Abdal Malik bin Nóh.
				..		
		421	1030	Muhammad.		
Al Káim be amerillah, . .	422	421	1030	Masaúd.		
		432	1040-1	Muhammad.		
		432	1041	Módúd.		
		440	1048	Masaúd II.		
		440	1048	Abúl Hasan Alí.		
		440	1048	Abdal Rashíd.		
		444	1052	Toghrál.		
		444	1052	Ferokhzád.		
		451	1059	Ibrahím.		
Al Moktadí beamerillah, .	467					
Al Mostazher billah, . .	487	492	1099	Masaúd III.		
		508	1114	Shírzád.		
		509	1115	Arslán.		
Al Mostarshid billah, . .	512	512	1118	Bahrám Sháh.		Sanjar, the Seljúk Governor of Khorásán.
Al Rashid billah, . . . .	529					
Al Moktafí leamerillah, .	530					
		547	1152	Khusrú Sháh.		
Al Mostanjid billah, . .	555	555	1160	Khusrú Malik.		

The second or reference number in the subjoined list of Coins indicates the heading, in the original Masson Catalogue,\* under which each piece should be classed.

\* I would take this, my earliest, opportunity of referring to a Review of my Essay by M. DeFremery, which appeared in the Revue Numismatique of Paris in



## SUBUKTIGIN.

No. 1. [ii.] Silver, highest wt. 46 gr. Perwan, *Six Coins.**Reverse.*

لله  
 محمد رسول  
 الله نوح بن  
 منصور  
 سبكتكين  
 ررة

Margin. Surah ix. 33, and lxi. 9.

*Obverse.*

لا اله الا  
 الله وحده  
 لا شريك له  
 الطابع لله  
 ر

Margin. هذا الدرهم بفروان  
سنة ؟

Average weight 43.6 gr.

NOTE.—I have not any books of reference at hand to enable me to determine whether the two Coins, whose legends are transcribed below, have been published in any of the numerous continental works on Sámání money; but their association in date and in proximity of place of issue with certain of the earlier Coins of the present series, as well as the illustration they afford of the distribution of the territorial tenures of the day, will, under any circumstances, render their insertion in this place appropriate.

Extrâ No. A. Gold, Wts. 57 and 61 gr. Herât A. H. 360 and 361.

*Reverse.*

لله  
 محمد  
 رسول الله  
 المطيع لله  
 منصور بن  
 نوح

Mar. محمد رسول الله &amp;c. للمؤمنون

*Obverse.*

الولي  
 لا اله الا  
 الله وحده  
 لا شريك له  
 محمد

Mar. Int. { بسم الله ضرب هذا الديفار  
 بهراة سنة ستين و  
 ثلثمائة [alt. سنة احدى و] ستين

Mar. Ext. لله الامر من قبل  
 &c. للمؤمنون بنصر الله

1849. I need not here enter into the several questions raised by my Critic, but I may candidly plead guilty to one of the two, I am proud to say the only two objections taken against me. For the rest the notice is most encouraging for my further efforts! and is altogether written in so kindly a spirit as to demand my warmest acknowledgments.



## ISMA'IL.

No. 2. [vii.] Silver, wt. 43 gr. *Rare.**Reverse.*

لله  
محمد رسول  
الله منصور  
بن نوح  
اسماعيل

*Obverse.*

لا اله الا  
الله وحده  
لا شريك له  
الطابع لله

Margins illegible.

## MAHMÚD.

No. 3. [to follow xvii.] Gold, wt. 52 gr. Herát A. H. 413. *New Type.**Reverse.*

لله  
محمد رسول الله  
يمين الدولة  
وامين الملة  
نظام الدين  
ابوالقاسم

*Obverse.*

عدل  
لا اله الا  
الله وحده  
لا شريك له  
القادر بالله

بسم الله ضرب هذا ال بهراة  
سنة ثلث عشرة واربعمائة

Margin. Surah ix. 33, and lxi. 9.

Mar. Ext. Surah xxx. 4, 5.

No. 4. [to follow xviii.] Gold, wt. 62 gr. Ghazní A. H. 415. *Unique.**Reverse.*

لله  
محمد  
رسول الله  
يمين الدولة  
وامين الملة  
ابوالقاسم

*Obverse.*

لا اله الا  
الله وحده  
لا شريك له  
القادر بالله

بسم الله ضرب هذا الدينار  
بغزنة سنة خمس عشرة واربعمائة

Margin. Surah ix. 33, and lxi. 9.

Mar. ext. Surah xxx. 4, 5.

Mr. Bardoe Elliot possesses a similar Coin of the Ghazni Mintage, dated  
اربعة عشرة واربعة i. e., 414, A. H.



No. 5. [xxii.] Silver, wt. 53 gr. *Rare.*

الله  
محمد رسول  
الله منصور  
بن نوح  
سيف الدولة  
محمود

لا اله الا  
الله وحده  
لا شريك له  
الطابع لله  
ب ص

Margins illegible.

No. 6. [xxv.] Silver, highest wt. 64 gr. *average 46.5 gr. Eight Specimens.*

*Reverse.*

• لله •  
محمد رسول  
الله يمين الدو  
لة وامين الملة  
محمود

*Obverse.*

عدل  
لا اله الا  
الله وحده  
لا شريك له  
القادر بالله  
يمينى

Margins illegible.

Mar. &c. بسم الله ضرب هذا الدرهم

No. 7. [xxvii.] Silver, wt. 44 gr. Ghazni A. H. 395, four Specimens.

*Reverse.*

• • •  
محمد رسول الله  
القادر بالله  
يمين الدولة  
محمود

*Obverse.*

يمينى  
لا اله الا  
الله وحده  
لا شريك له  
ص د

Margin. S. xxx. 4, 5.

Margin. بسم الله ضرب هذا الدرهم  
بغزته سنة خمس وتسعين وثلثمائة

No. 8. [No. xxx. &c.] There are 18 Coins in Col. Stacey's collection offering various subordinate modifications of the general type of the class just described. The leading trilinear legend of either area remains constant, but the monograms vary in their style and position—at times the word *عدل* is introduced at the top of the obverse field, and the *يمينى* figures at the foot of the main inscription, *الله* also is seen to head the legend on the reverse—and the characters, in which



the name of Mahmúd is expressed, differ considerably in the several specimens, graduating from the formal letters of the old Kufic to the interlaced flourish of more modern writing. In some examples again, the titles *ابوالقاسم* and in others *امين الملة* are engraved in fine lines within the areas, but the position they occupy is indeterminate.

Where decipherable, the obverse marginal legends usually purport that the piece was coined at Ghazní in A. H. 395 *et seq* ; but in many of these Coins the marginal spaces are filled in with mere unmeaning repetitions of short perpendicular lines and small circles, which last in imperfectly formed Kufic legends answer for either *و ه م* or *و*

No. 9. [to follow xliii.] Silver, wt. 37 gr. *Unique.*

<i>Reverse.</i>	<i>Obverse.</i>
الله	عدلى
محمد رسول الله	لا اله الا
على الله عليه وسلم	الله وحده
القادر بالله	لا شريك له
يمين الدولة	ه يميني ه
وامين الملة	
محمود	

Margins illegible.

NOTE.—[No. liv.] While last year at Jhelum, I met with a variant of the elaborately designed copper money of Mahmúd described and figured under No. liv. of my list in the Jour. Royal As. Soc. The Jhelum specimen possesses the peculiarity of having the word *كورة* inserted before the name of the city of Ghazní [thus *بكورة عزنة*] This is the only instance within my knowledge of the use of this prefix in this series.

I am indebted to Sir H. M. Elliot for the reference to the subjoined notice of the impositions practised by certain Hindus, which led to an extensive deterioration in the local standard of Mahmúd's Silver coinage.

The Persian text appears defective, I however give it, as it stands, merely inserting variants from a second copy, without at present entering into any further remarks.



## مذخب از كتاب جامع الحكايات ولوامع الروايات

حكايت آورده اند كه چون يعين الدولت ببادشاهي نشست و آثار سياست او در ممالك برسيد حكماي هند را آنها برانداختند [زدند] و حيلتي پيش آوردند و اول درمي [در] پيش آوردند تمام عيار و قيمتي فراخور بروي نهادند چون يكچندي برفتند چون [و] رعيت درستدن صادقديدند بتدريج عيار باز كم كردند تا [و با] بازرگانان سود نقره مي كردند و خلق كم عياري بديدند [نديدند] از اقصادي جهان درم نقره بهند مي بردند چون اين فساد از حد بگذشت و علماء الدوله ببادشاهي نشست روي بتدارك ان خلل آورد و با بزرگانان راي زد كه اين را چگونه تدارك بايد كرد اشاره كردند كه ان نقود را بدل از خزانه بايد آورد و بازرگانانرا عوض بدادن [بايد داد] علماء الدوله بفرمود تا از خزانه صد بار هزار درم نقره اطلاق كردند و بدارالضرب بردند و بمصالح بندگان خداي تعالى صرف كرد و اثر نيكنا مي او در اقطار جهان روشن گشت \*

Dr. A. Fleming in his *Diary of a Trip to Pind Dadun Khan, and the Salt Range*, published in a previous number of the *Journal Asiatic Society* (Vol. 18th p. 661) gives a very complete description of the method of coining in use in the Mint at Pind Dadun Khan in 1848. The process indeed is the essential counterpart of that described by Abul Fazl as obtaining in Akber's time.

If we may also assume that similar mechanical means were resorted to in the earlier days to which the above tale refers, we may satisfy ourselves of how easy it would have been to have had a mint in every house and how difficult it would be to prevent the issue by private individuals of money of an inferior standard.

MASA'UD.

No. B. [To precede No. lviii.] Gold—*Mr. Bardoe Elliot.*

*Reverse.*

لله

محمد رسول الله

نا صدين الله

حافظ عباد الله

ظهير خليفه الله

مسعود

Margin (as usual.)

*Obverse.*

القايم

لا اله الا الله

بما وحده لا شريك له

القادر بالله

ولي عهده

Margin, illegible.

Margin Ext. (as usual).



NOTE.—The above Coin displays with unusual completeness the various honorary titles by which Masaúd was designated.

As connected with the subject I transcribe from the copy preserved by Bihaki a detail of Masaúd's recognised titular designations as accepted by the Khalíf's Ambassador, in 423 A. H.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ مِنْ عَبْدِ اللَّهِ ابْنِ عَبْدِ اللَّهِ أَبِي جَعْفَرِ الْأَمَامِ الْقَائِمِ  
بِأَمْرِ اللَّهِ أَمِيرِ الْمُؤْمِنِينَ إِلَى الْوَاصِلِينَ اللَّهُ الْحَافِظُ لِعِبَادِ اللَّهِ الْمُتَّقِمِ مِنْ  
أَعْدَاءِ اللَّهِ ظَهِيرِ خَلِيفَةِ اللَّهِ أَبِي سَعْدٍ مَوْلَى أَمِيرِ الْمُؤْمِنِينَ بْنِ نَظَامِ الدِّينِ

Again in another place (under A. H. 424), our author entitles the Sultán

وَاصِلِ الدِّينِ اللَّهُ وَحَافِظُ بِلَادِ اللَّهِ الْمُتَّقِمِ أَعْدَاءِ اللَّهِ أَبُو سَعِيدٍ مَسْعُودٍ

Albírúnis' enumeration, as found in the unique copy of his *Kánún-i-Masaúdí* which has lately come into the possession of Sir H. M. Elliot, varies but slightly, being to the following effect :

الْمَلِكِ الْأَجَلِ السَّيِّدِ الْمُعَظَّمِ خَلِيفَةِ اللَّهِ وَوَاصِلِ الدِّينِ اللَّهُ وَحَافِظُ عِبَادِ اللَّهِ  
الْمُتَّقِمِ أَعْدَاءِ اللَّهِ أَبِي سَعِيدٍ مَسْعُودٍ

No. 10. [to follow 58.] Gold, wt. 57 gr. Ghazní, A. H. 423. *Unique.*

*Reverse.*

لله  
محمد رسول الله  
صلى الله عليه  
الناصر لدين الله  
مسعود

Margin. Surah ix. 33 and lxi. 9.

*Obverse.*

لا اله الا  
الله وحده  
لا شريك له  
القائم بامر الله

بِسْمِ اللَّهِ ضَرْبُ هَذَا الدِّينَارِ  
بِغَزَنَةِ سَنَةِ ثَلَاثٍ وَعِشْرِينَ وَارْبَعِمِائَةٍ  
Mar. int. Mar. ext. Surah xxx. 4, 5.

No. 11. [to follow 58.] Gold, wt. 54 gr. Ghazní, A. H. 423. *Unique.*

*Reverse.*

لله  
محمد  
رسول الله  
عليه السلام  
مسعود

Margin. S. ix. &c.

*Obverse.*

Area as in the last Coin.

Margins, as in the last Coin.



No. 12. [lviii.] Gold, wt. 69 gr. Ghazní, A. H. 428. *Unique.*

*Reverse.*

لله  
محمد رسول الله  
القايم بامر الله  
ناصردين الله  
ابو سعيد

Margin. Surah ix. 33 and lxi. 9.

*Obverse.*

عدل  
لا اله الا الله  
وحده لا شريك له  
مسعود بن محمد

Margin. بسم الله الرحمن الرحيم  
ضرب هذا الدينار بغزنه سنة ثمان  
وعشرين واربعماية

Mr. B. Elliot has a Coin of this type dated Ghazní 427, A. H.

I would draw attention to the modification that is seen to occur in the characters in which the legends of this Coin are expressed, as contrasted with those in previous use.

The change from the stiff outlines of the Kufic in Nos. 10 and 11, to the Persian writing in No. 12 is most marked, and illustrates effectively the lost supremacy of the Arabic tongue and the complete recognition of the more intelligible Persian as the Court language. Bihaki indeed shews that so early as A. H. 423 Masaúd's ministers had some difficulty in corresponding with the Court of Baghdád, and apparently still more in selecting fit speakers for the vivâ voce intercourse of Embassies, &c.

No. 13. [lxi. ] Silver, broken Coin. Balkh A. H. [4] 22.

*Reverse.*

لله  
محمد  
رسول الله  
عليه السلام  
مسعود

Margin. Surah xxx. 4, 5.

*Obverse.*

لا اله الا  
الله وحده  
لا شريك له  
القادر بالله  
الدرهم ببلخ  
سنة اثني وعشرين

A second specimen bearing similar legends varies in having the Khalif's name engraved in full sized letters. The Coin retains the imperfect date of 420? واربعماية



No. 14. [lxii.] Silver, broken Coin.

لله	عدل
محمد	لا اله الا
رسول الله	الله وحده
القايم بامر الله	لا شريك له
مسعود	بسم الله
Margin. Surah xxx. 4, 5.	ين ————— واربعماية

Before closing this notice of the Coins of Masaúd, I am anxious to make known an important variety of his Silver money, which has lately come into the possession of Mr. E. Bayley. The piece in its general outline and leading types corresponds closely with the common Bull and Horseman Coins of Samanta Deva (Jour. As. Soc. Vol. IV. pl. 36, figs. 3, 4, &c.) but it offers the peculiarity of displaying the name of **مسعود** engraved in well defined Kufic characters, on the field in front of the Horseman's face, or in the space usually held by the word **عدل**

A second similar specimen retains traces of the name of **محمد** occupying the same position.

I consider these pieces to be the produce of the metropolitan mint of the Hindu kingdom of Kabul, the site of which is not as yet satisfactorily determined—and it is in consonance with the usual policy of Mohammedan conquerors to suppose that the local mint was allowed to maintain its old style of issue, modified only by the impress of the name of the ruling Sultán.

This explanation may possibly account for the previously felt difficulty of there being no extant Ghaznáví Kufic Coins inscribed as struck at Kabul.

In my previous paper on the Coins of the Kings of Ghazní (p. 77) I quoted a passage from Abúl Fedá regarding Masaúd's territorial possessions—as some of the names are imperfectly determined I annex the following passage from Bihaki in further elucidation of the subject.

وامير المومنين منشوري تازة فرستد خراسان و خوارزم و نيم روز و زابلستان و جمله هند و سند و جفاندا و ختلان و قباديان و ترمذ و قشدا



وَمَكْرَانِ وَدَانِشْتَانِ وَكِكَا هَانِ وَرِي وَجِبَالِ وَسِپَاهَانِ جَمَلَه تَا عَقْبَه حَلَوَانِ  
وَكُرْكَانِ وَطَبْرَسْتَانِ دَرَانِ بَاشَدِ وَبَاخَا قَانِ تُرْكُسْتَانِ مَكَا تَيْبِ نَكْفَدِ

### MODÚD.

No. 15. [lxxix.] Silver, wt. 46 gr.

#### Reverse.

مُحَمَّدُ رَسُولُ اللَّهِ  
الْقَائِمُ بِأَمْرِ اللَّهِ  
شَهَابُ الدَّوْلَةِ  
مُودُودُ

Mar. illegible.

#### Obverse.

عَدْلٌ  
لَا إِلَهَ إِلَّا اللَّهُ وَحْدَهُ  
لَا شَرِيكَ لَهُ  
س

Mar.

بِسْمِ اللَّهِ

No. 16. [lxxxiii.] Silver, wt. 55 gr.

#### Reverse.

\* فَتْحٌ \*  
مُحَمَّدُ رَسُولُ اللَّهِ  
شَهَابُ الدَّوْلَةِ  
وَقُطْبُ الْمُلْكِ  
مُودُودُ

#### Obverse.

عَدْلٌ  
لَا إِلَهَ إِلَّا اللَّهُ وَحْدَهُ  
لَا شَرِيكَ لَهُ  
الْقَائِمُ بِأَمْرِ اللَّهِ

Margins illegible.

### IBRAHÍM.

No. 17. [to follow cix.] Silver, weight 48 gr. *Unique.*

#### Reverse.

• ٧ •  
مُحَمَّدُ رَسُولُ اللَّهِ  
ظَهِيرُ الدَّوْلَةِ  
الْمَلِكُ  
إِبْرَاهِيمُ  
ع

#### Obverse.

لِلَّهِ  
لَا إِلَهَ إِلَّا اللَّهُ  
وَاحِدٌ لَا شَرِيكَ لَهُ  
الْقَائِمُ بِأَمْرِ اللَّهِ  
نَصِيرِي

Margins illegible.



No. 18. [cxxiii.] Silver, weight 42 gr. Two specimens.

<i>Reverse.</i>	<i>Obverse.</i>
• قاهر • محمد رسول الله السلطان الاعظم قاهر الملوك سيد السلاطين ابراهيم	لا اله الا الله وحده لا شريك له القايم بامر الله ملك الاسلام نصيري

Margins illegible.

No. 19. [cxlii.] Silver, weight 44 gr. [Ghazni].

<i>Reverse.</i>	<i>Obverse.</i>
سلطان محمد رسول الله السلطان الاعظم يدين الدولة بهرامشاه ع	الله لا اله الا الله المسترشد بالله عضد الدولة سنجر

Margins illegible.

(Under No. cxl.) Since the publication of the Catalogue of Mr. Masson's Ghazni Coins, I have met with a specimen of Arslan's money of the Lahore Mint Type.\* The Obverse bears the usual Bull of Siva with the legend श्रीसमन्त देव

The Reverse displays the words السلطان الاعظم ملك ارسلان

No. 20. [cxlix.] Silver, weight 46 gr. Two specimens.

<i>Reverse.</i>	<i>Obverse.</i>
ناصر محمد رسول الله السلطان الاعظم معز الدولة خسر وشاه	الله لا اله الا الله المقتفي لامر الله عضد الدولة سنجر

Sic. —————

Margins contain no legends, but are filled in with dots.

\* Jour. As. Soc. Beng. Vol. IV. Pl. xxxvi. Fig. 23 and xxxvii. Fig. 46.



Among other specimens of minor value Col. Stacey's cabinet contains :

1st. Two (mixed Silver and Copper) Coins of Khusrú Malik No. cliii.—having the imperfect imitation of the Bull Nandi in Toghra on the Obverse, with the King's name prefaced by the title of تاج الدوله on the Reverse.

2nd. Fourteen Coins of the common Type, No. cliv. (Pl. xx. Fig. 16, Ariana Antiqua).

3rd. One specimen of No. clv.

Col. Stacey's collection is likewise rich in Khwárizim Coins, which have been forwarded to me with the Ghaznaví series. However as I do not propose to take up this class of money at present, I confine my notice to a single Coin, which is remarkable as bearing the name of a new Mint, *Zemíndáwur*. The piece is of mixed Silver and Copper, in weight 48 grains. The Obverse and Reverse read through, but singular to say the marginal legends being completed thus — Reverse. ابو الفتح محمد — Obverse. السلطان الاعظم علا الدنيا والدين.

The inscription, in the Reverse Circular Area, commences the word زمين and the obverse centre gives the completion of the name داور — زمين داور —

*On the Oriental character of certain Northern Antiquities.—By*  
GEORGE BUIST, Esq. LL. D.

I some time since received from Mr. Chalmers, of Auldbar, three copies of his splendid work on the Cross Stones of Forfarshire, one for my own use, the other two to be disposed of as I thought best. I have given one of them to the Bombay Branch of the Royal Asiatic Society, and cannot better bestow the other than on the oldest and most distinguished learned body amongst us, the Bengal Asiatic Society. The subject treated of by Mr. Chalmers, is, as will presently appear, decidedly Oriental, and the remarks I am about to make may probably have some influence in stimulating to enquiry on the subject: perhaps this may for the first time make some of your readers aware of the existence of a much closer relationship betwixt Oriental and Hyperborean Antiquities than they might be altogether prepared for.



Lest it might be imagined from the minuteness with which the most elaborate details are given, and the extreme beauty of the lithographs altogether, that they have been in any way embellished, I forward for the inspection of the Society a drawing book of my own, in which rough, half-finished sketches, having no pretension to artistship whatever, will be found of a large portion of the stones represented in the work of Mr. Chalmers; and it will be seen that the two coincide as closely as it is possible for first-rate lithographs to do with indifferent China ink or pencil sketches. My drawings were mostly made betwixt 1820 and 1835, more than twenty years before Mr. Chalmers' were dreamt of; and at the time referred to, there were a number of the Sculptures entire,—the most important being the Eassie Sphinx, to be referred to by and bye—which seem since to have become obliterated; and I have given a number from Fife, Perth, and Aberdeenshire, that will assist in illustrating what is about to be stated. In an article in a recent number of "*Blackwood's Magazine*" on these matters, the difficulty of obtaining correct drawings, and the diversity of appearances presented by the Sculpture according to the light in which it is viewed, is so enlarged upon, that the impression left on the reader is that much must be ascribed to the imagination. That it is not so, will be seen from a comparison of the lithographs with my drawings rude as they are. Every man accustomed to decipher moss-grown, or time or weather worn sculptures, whether in India or in England, has encountered the difficulties enumerated by Blackwood, which may always be surmounted by care and patience, so as to leave no doubt on the mind as to perfect fidelity of result.

For shortness sake I shall in the following observations make use of the name of "*Runic Stones*," generally applied to this class of monuments, stating at the same time that I feel satisfied that it is a misnomer, and that they have no connection whatever with the Danes, or any other modern European nation.

Runic Stones are unknown in the Continent of Europe, and are not to be found in any part of England or of Wales, or in the Southern Counties of Scotland—the Ruthell Stone belongs to a very recent period in comparison, and I am not aware of any of them being found to the South of the Forth and Clyde. There are five or six in different parts of Fifeshire, the St. Andrew's Stone Coffin being one of the most



interesting in existence : they abound in Forfarshire, and in the South-eastern portion of Perthshire, they abound in Aberdeen and Ross-shires, or generally over the region chiefly known as Pictland. There are abundance of Danish crosses in Man, with Celtic Crosses in the Hebrides and Western Highlands, bearing a close general resemblance to those about to be described, but sufficiently distinguishable from them to any one who has studied the characteristic feature of Runic stones. The crosses in Wales are of comparatively recent date—those in Ireland so closely resemble the Scottish stones and their origin is so deeply buried in the shades of antiquity, that, associated as they both are with the Round Towers, a class of objects equally mysterious and perplexing to antiquaries, and which clearly owe their origin to a date beyond that to which history, or even tradition extends, though we are disposed to assign them a common age and origin.

In a paper prepared for publication fourteen years since, and which appears in the second volume of the transactions of the Bombay Asiatic Society in 1843, I stated my belief that they had been brought into existence within our æra, and had some connection with the Christian faith, or with the going out of the old creed and coming in of the new, I have since then seen reason to alter my views, and to come to the conclusion that the class of monuments called Runic stones came into existence more than two thousand years ago, and were meant, in many cases, to represent Oriental animals or objects, being sculptured at a time when there was some traditional or actual connection betwixt this portion of Great Britain and the East, which had ceased to exist long before the Norman invasion. It is on these grounds I have taken the liberty of addressing myself to the Bengal Asiatic Society, in hopes that by this means some glimmering of light may be thrown on a matter of such interest and obscurity.

It appears to me one of the strangest things in the history of archeological research that we should for years have been hunting out the antiquities of Athens, Egypt, and Syria, and latterly should have devoted ourselves to the collection of monuments of antiquity from Central Asia and Assyria, while we leave a class of relics bearing on the early history of our own country, neglected at our doors, and perishing before our eyes.



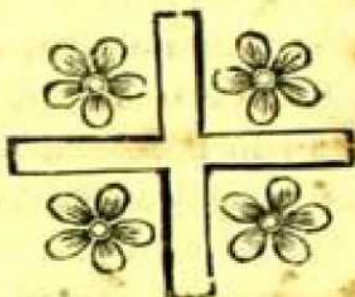
Since the Thirteenth Century, when the Church of St. Vijeans, near Arbroath, in the basement of which one of them is found as a foundation stone, was constructed, they have received no reverence from any one, and no mercy at the hands of the stone mason, having been built into house walls, or field enclosures, and broken up and destroyed as often as it suited. At this moment two of the finest Runic stones in Scotland stand as gate posts at Dukeld Church Yard ; one of them turned upside down !

At Monike one, and at St. Vijeans, as already stated, a second is built into a Church wall : at Dunnichers one forms a portion of a park dyke ; at Cossens, near Glamis, another serves as a rubbing post for cattle—to the very great disgrace, as it appears to me, of the antiquaries of my native country.

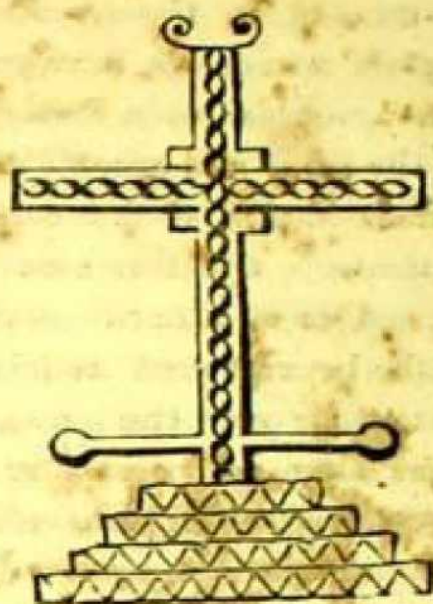
The monuments under consideration are generally single oblong blocks of stone, of from three to eighteen feet in length, and from one to fifteen in breadth, mostly in the form of the grave stones in country churchyards. They for the most part have a cross, of the form commonly called the Cross of Calvary, sculptured on them—in many cases they are fashioned in the form of a cross. There is no single instance in which a crucifixion is represented, or in which the cross is provided with the tablet at top always found in the crosses seen in Catholic Churches for the superscription of “ King of the Jews.” The arms of the cross are almost always united by a richly sculptured circle or ring, and the shaft and limbs are covered with most elaborate sculptures.

The cross is far from being an eminently Christian symbol : they are often found in Oriental sculptures. The following is an outline of a cross very much resembling those of the Scottish monuments, copied from the vestment of a Coptic Priest, now in the British Museum, and believed to belong to a date 600 B. C. at least, together with a cruciform ornament, of which there are abundance of examples on the Catacombs recently opened near Alexandria, and at least 2000 years old.





Part of an ornament. Catacombs.



Coptic cross, 600 B. C.

Sometimes Runic stones are found as sculptured slabs—in one case a set of them have obviously formed a stone coffin : there are probably about two hundred of them still in existence betwixt Edinburgh and Caithness—by far the largest and most magnificent is Suenos pillar, in Murrayshire, of which, so far as I know, there is no correct or trustworthy representation in existence !

The merely ornamental portions of the sculptures consist of the most elaborate tracery, in which the interlacement of serpents and lizards, or monstrous creatures betwixt the two, are prevalent. Several favourite Egyptian ornaments make their appearance, and though the workmanship be rude in the last degree, the sculptor having obviously begun without a drawing, or without so much as outlining the design meant to be engraven, as may be seen from the way in which the figures are distorted and crammed together at the place last finished, it is clear the conception of the original designer was an able and an elegant one.

The pictorial part of the sculpture consists of the representation of deer-hunts, where we have the great blood-hounds pulling down the deer, with all varieties of lesser dogs—trumpeters, and bowmen, and spearmen, on foot, and richly-attired riders on horse-back ;—of religious or other processions of men, with arms or branches in their hands,



and so forth of the same general character as that of the far-famed Nimroud obelisk, though of infinitely inferior execution; of warlike encounters where we have on the Aberlemno stone, in Mr. Chalmers' collection for example, horsemen charging a phalanx of foot soldiers, where the front and second rank men stand with presented spears, the third rank having theirs erect, ready to be used should the enemy burst through the foremost ranks. On several stones we have the representation of a bard playing on a harp, and on several others an encounter betwixt men and animals. In three cases a man is represented tearing open the jaws of a creature like a wolf or lion.

By far the most interesting sculpture I have had the fortune to examine—Suenos' pillar I have never seen—is that on the St. Andrew's stone coffin, the character of which I was the first to point out. I had the pieces, which were in the act of being carried away piecemeal, collected and arranged together, and got a cast in plaster made of the whole in 1839, for the County Museum in Cupar, then under my charge: a drawing of the principal tablet, furnished by me from an excellent sketch by the Rev. Mr. Lyon, is published in the Pictorial History of England. You will find a drawing of it in the MS. volume, with a bad lithograph in the Bombay Transactions. At the one end is represented a man in rich flowing garments, and with a full-bottomed wig, showing a rich belt, and ornamented sword sheath, tearing open the jaws of a lion—the character of the animal is clearly brought out by his short snout, his mane, and tuft at the end of his tail. The wig, the belt, and the sword sheath closely resemble those of the figures on the Assyrian marbles. Further on is a dog-like quadruped with wings, pouncing on a deer, and then a huntsman with a spear in his right hand, and a small ornamented shield in his left arm: three grey-hounds, what seems a wolf or fox, with a couple of deer, are before him. In the corner above these are some other dogs and deer, with bad representations of two monkeys. On the upper and middle portion of the stone is a man on horseback: he is richly attired, wears a full-bottomed wig, and his sword-sheath, seen from under his mantle, is richly and elaborately sculptured. On his left wrist he holds a hawk—a lion, in this case represented with considerable fidelity and spirit, has sprung on the neck of his horse, the attack being much more coolly received than such things are in modern times.



When the circumstances in which this monument was found are considered, there can remain no doubt of its very great antiquity. From the time the Cathedral of St. Andrew's was destroyed at the Reformation, the roof was, unless in so far as it supplied building stones, suffered to remain where it fell till 1826, when it was cleared away down to the floor. In 1833, a grave was dug deeper than the foundations of the Cathedral itself, six or eight feet lower than the floor, and here the stone coffin was found, in separate pieces, and not as if remaining where it had been originally placed—the richness of the sculpture clearly indicating that it was meant to be a Sarcophagus for exhibition above ground.

We are thus at once carried back to the Twelfth Century at latest, an age to which it could not have belonged, Scotland from this time back, so far as history extends, being in a state of the utmost barbarism. Yet here we have a series of representations most obviously Oriental—the elaborately curled wig and massy sword-sheath of Old Assyria—the lion and the monkey of tropical climates! How came they to be represented on a Scottish monument at all?

On many of the Runic stones, again, there is the figure of a strange flapping-eared, long-snouted animal, which I have no doubt represents an elephant: it is not at all like the animal itself, it is true, though it is like no other in creation, but it very closely resembles the figures of it I find in the Bombay Bazar.

You will find on the Aberlemno stone two winged figures, and two others on the Essie stone, one of these being defaced so as not to show the bird's head in the lithographs. If you will turn to my sketch-book you will find a drawing, made about twenty-five years ago, when the stone was more entire than when Mr. Chalmers saw it, in which one of these is represented as with a human figure, with an eagle's wings, head and beak—it might in fact pass for a rude copy of one of Mr. Layard's Assyrian drawings, as might the other winged figures just referred to, for some of his other drawings. Surely coincidences such as these can neither be fanciful nor accidental.





SPHINXES ON THE STONE CROSS AT ESSIE—FORFARSHIRE.

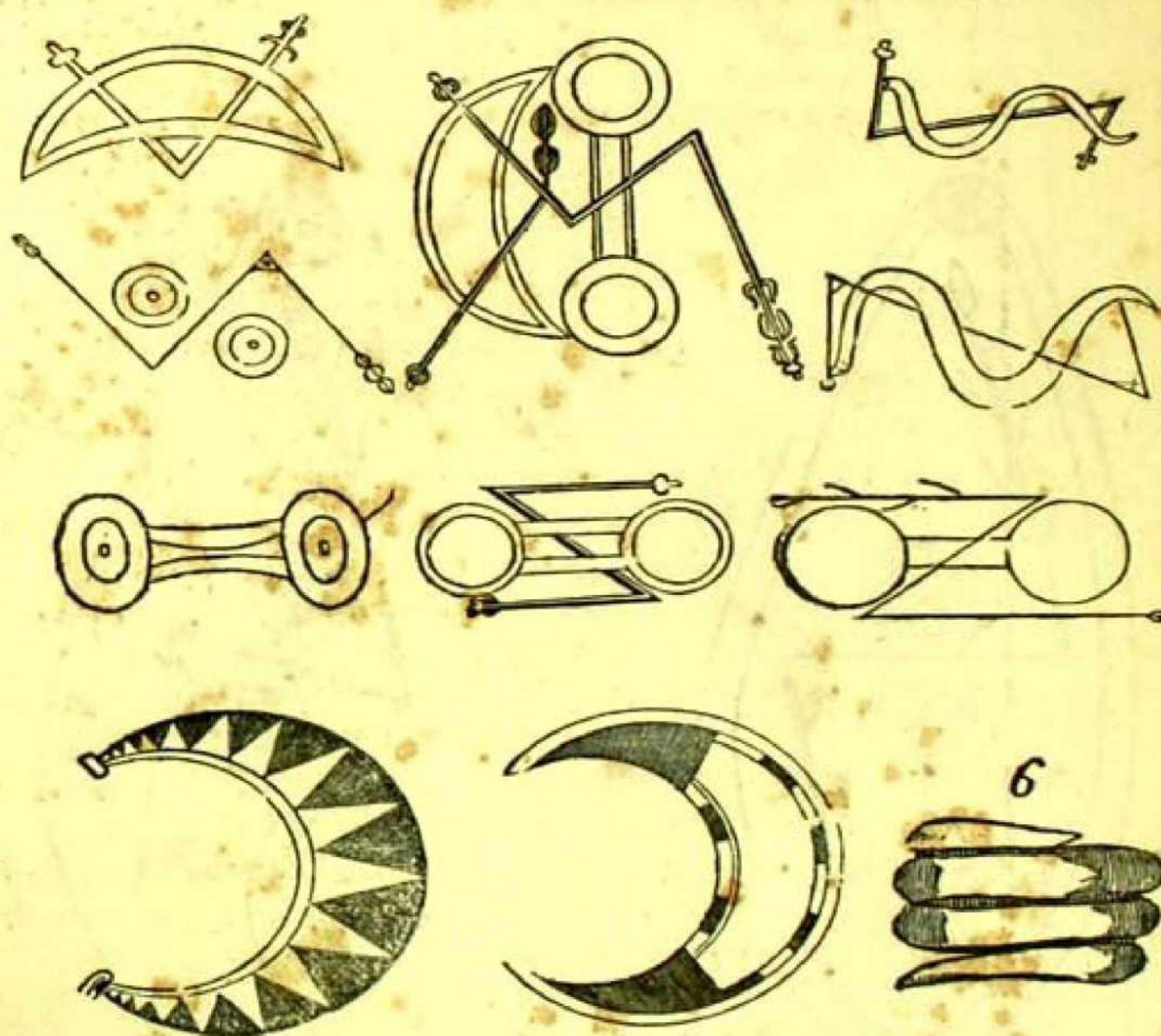


ASSYRIAN SPHINX—LAYARD.

That the whole of the Runic stones known by this name to antiquaries are of the same class, belong to the same age, and refer to



kindred events is proved on much more direct evidence than that of mere general resemblance, striking as this is : there are certain most remarkable symbols, of which the following are specimens, the meanings of which have never been attempted to be explained, that are common to one or more, if not nearly all the stones :—

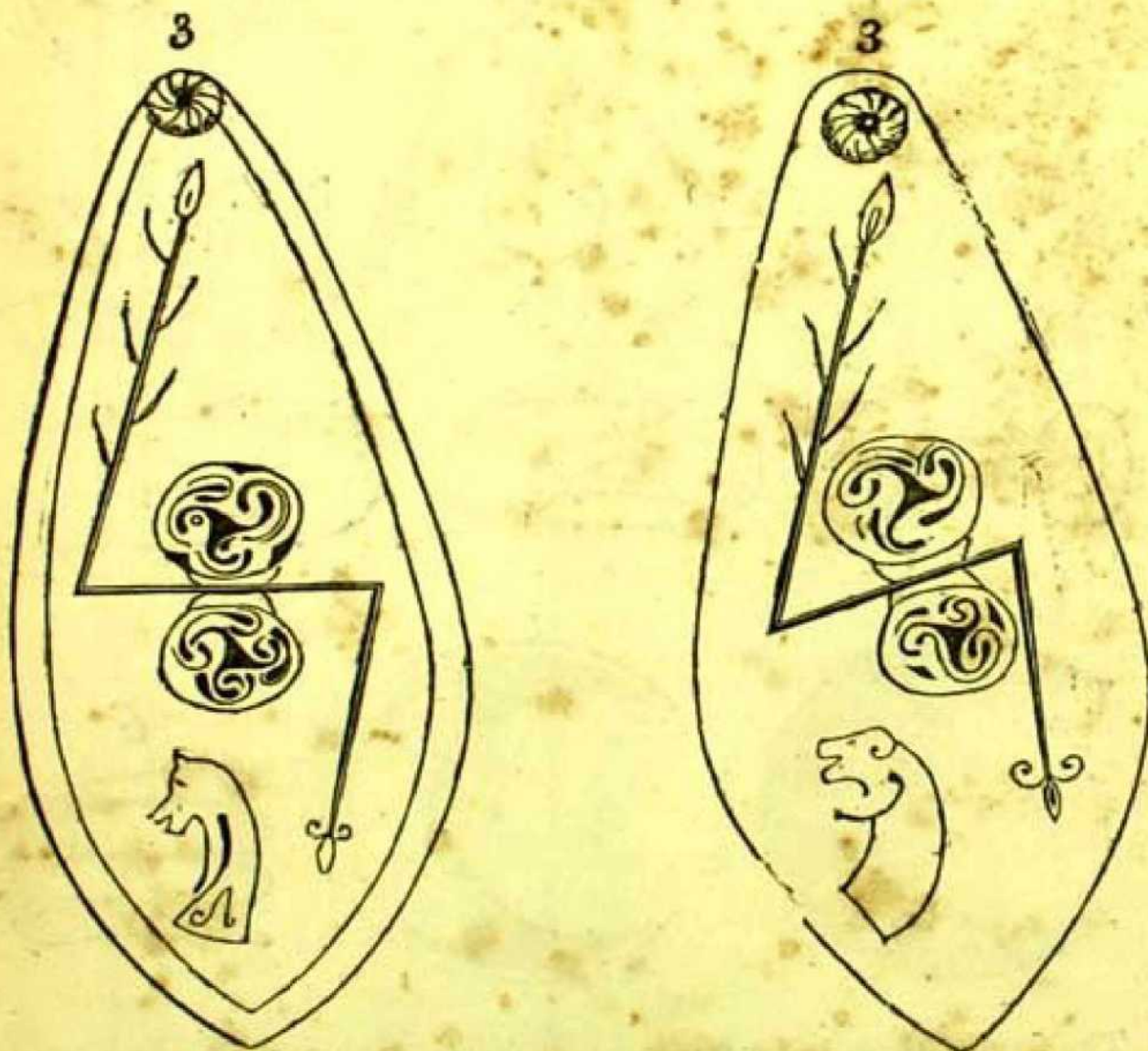


The first of these is a crescent or cunette, found, however, more or less richly ornamented, and which is sometimes represented by itself ; sometimes it is cut by the second symbol in the series, a zig-zag, with sceptre-heads at either extremity. This again, is often blazoned on with a couple of circles of equal size, connected together by two bars ; sometimes it is intertwined by a curved snake, but it is always in its own leading features the same. The third symbol is a pair of cuts

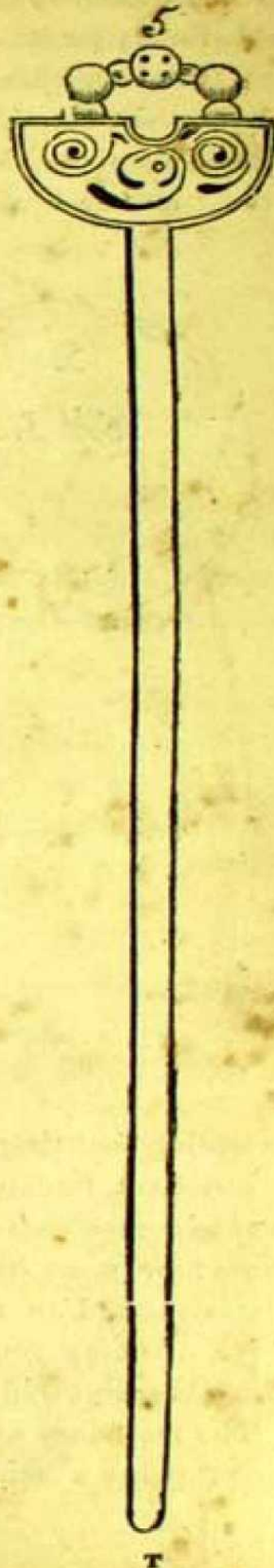
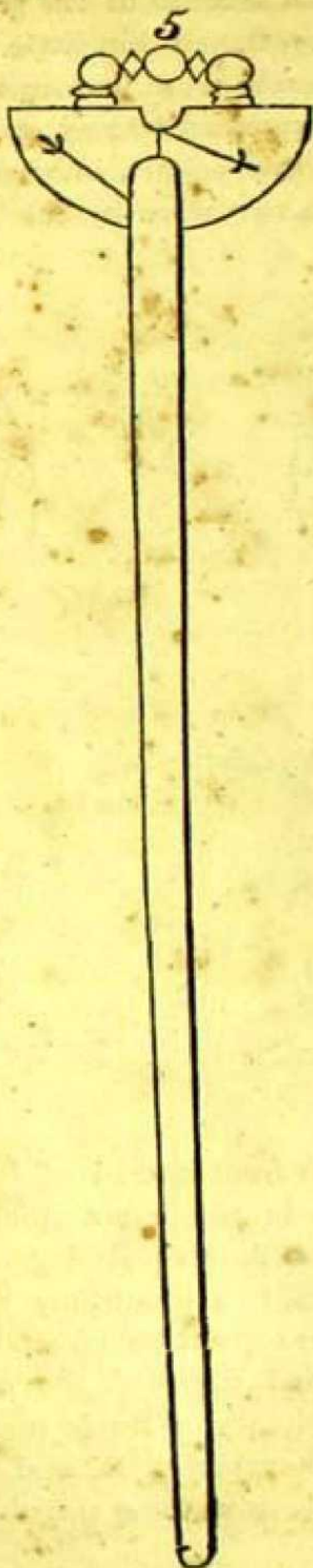


over each other, of unequal size, and there are various other symbolical figures frequently, though not uniformly, met with.

The conclusion of Mr. Chalmers' collection contains drawings of a set of pieces of silver armour, found in a Tumulus or Lou called Norres Lou in the south of Fife, of which the following representations will give you an idea of the principal parts :—

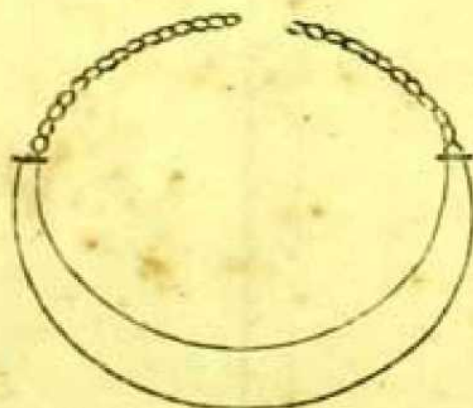
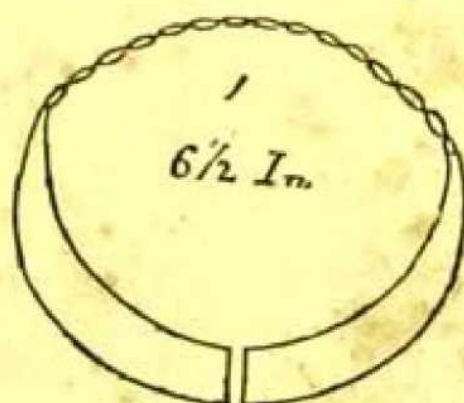
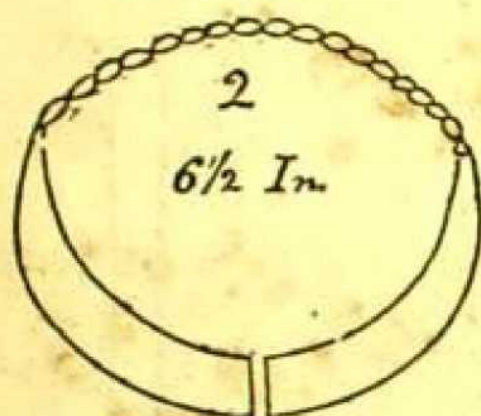








Mr. Chalmers reprints an account of the selections prepared by me sometime after its discovery, though but little could be learnt regarding it: the absurd law of treasure trove had hurried the bulk of it to the melting pot before being examined by any competent authority. The fragments remaining are two collars, in shape, size and aspect perfectly identical with those now worn by children in this part of India,



excepting that they open in front instead of behind. Alter this, and a merchant finding them in the bazar would swear they were of Bombay manufacture: a snake-shaped finger ring, very similar to those now worn by natives, two beautifully worked bodkins, and the plates, seemed to have been portions of a shirt of scale mail. On three of these you will find engraved the most conspicuous of the symbols sculptured on nearly all the Runic stones!

The frequency of the occurrence of Oriental figures is reason enough for assuming a connection betwixt these singular monuments and the



East, of what nature or amount cannot be determined—the cross gives them the only claim to an origin within the Christian æra, and then this is destroyed by the absence of all the usual crucifixion peculiarities of the symbol, as used by Christians, while the embellishment of the cross was frequently to be met with before the introduction of Christianity.

It is quite clear, from the conflicts betwixt the earliest historians, quoted by Mr. Chalmers, that by the Fourteenth Century, tradition itself was silent regarding them, and that the stories, such as the stones themselves suggested, were manufactured, accepted, and circulated to suit the fancy or the occasion, and the other fact of their being found as building stones in our very oldest edifices shows them to have fallen into neglect still earlier than this. Yet it is impossible to suppose that in these rude and remote ages so large a number of monuments so elaborate could have come into existence without some strong special reason, widely recognised, and of the most powerful influence amongst the people.

And this once more carries us deep into the recesses of the dark ages, extending back far beyond the Roman Conquest, during which a barbarity prevailed over the western parts of Europe, barren alike in tradition, literature, monuments and architecture, and sends us to seek for the origin of our sculpture to periods long antecedent to these, when the Cromleche and the rocking-stone, the unhewn pillar, the rude block and shapeless cairn, were all that were aspired after for religious or monumental purposes—as far back beyond the ages of those we call the aborigines of Britain, as the Pyramids and sculptured stones of Yutacan, precede the days of the red men, Cortez found peopling America.

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*On Dust Whirlwinds and Cyclones.* By P. F. H. BADDELY, Esq.  
M.D.; B. Art<sup>y</sup>. Lahore.

“ Who holds the furious storms in straighten’d reins,  
And bids fierce Whirlwinds wheel his rapid car ?”

YOUNG.

During February and March, 1851, while engaged in the investigation of Dust Whirlwinds, I twice witnessed a curious fact, which seems to throw considerable light upon the complicated phenomena of Storms.

In following up on horseback a dust whirlwind, I observed that as it passed various objects in its progress, such as tents, horses, &c. it gradually diminished in size, till at length instead of a whirling circle of 5 or 6 feet in diameter, composed of several rotating cones or spirals of dust, Plate 2, it terminated in a single cone, the apex of which in contact with the earth, rotated briskly like a top, from left to right, as did the whirling circle before, of which this was a portion.

From the cone of dust, a long ribband-like band about 12 inches in diameter, of equal dimensions throughout, as far as the eye could reach, was seen to extend into the atmosphere, and from the circumstance of its sides presenting a greater opacity than the central portion, I concluded it was cylindrical.

This band was rendered faintly visible by the dust it had whirled up, which by the light of the sun that shone through it, exhibited a kind of vermicular spiral motion. At about 50 or 60 feet above the surface of the ground, the band formed a distinct coil, as represented in the plate, still preserving its cylindrical appearance, and extending upwards and forwards in advance of the whirling cone, Plate I, Fig. 1.

Suddenly the Cone, which had the last continued to rotate, vanished from the earth, and the whole band then slowly receded upwards and onwards out of sight.

The common dust whirlwind, is I conceive, a miniature representation of a Cyclone, and this band seems to indicate the ultimate thread of the electrical spiral mass of which the whirlwinds are composed.

Whirlwinds large and small, appear to be made up of a number of



of the equator, rotate from right to left  $\curvearrowright$  and those to the South of the equator from left to right  $\curvearrowleft$ .

Having therefore determined the probable track of a rotatory storm—face the point to which the storm is supposed to be travelling—the stronger centripetal winds will then be found blowing on the right hand in the Northern Hemisphere—and on the left hand in the Southern.

The stronger centripetal winds on the side of progression, must for the reason above-stated, blow more or less in the direction of the storm's track ; while those on the opposite side of the whirling ellipse, will be opposite to it, and much more limited in extent.

The Diagram of Pl. 3 indicates more plainly what I have attempted to explain.

I have there described the winds surrounding the electrical zone as strait-lined winds, blowing from a circumference to a centre, as centripetal tangents ; which centre is the revolving ellipse or zone, forming the body of the Cyclone.

The mass of electrical matter of which the body of the Cyclone is composed, descends I presume, as in the case of the small whirlwinds from the sky to the earth, in the form of a spiral, working downwards ; and its subsequent movements and the track, may depend in a great measure on causes connected with the earth's rotation, and upon the prevailing surface winds.

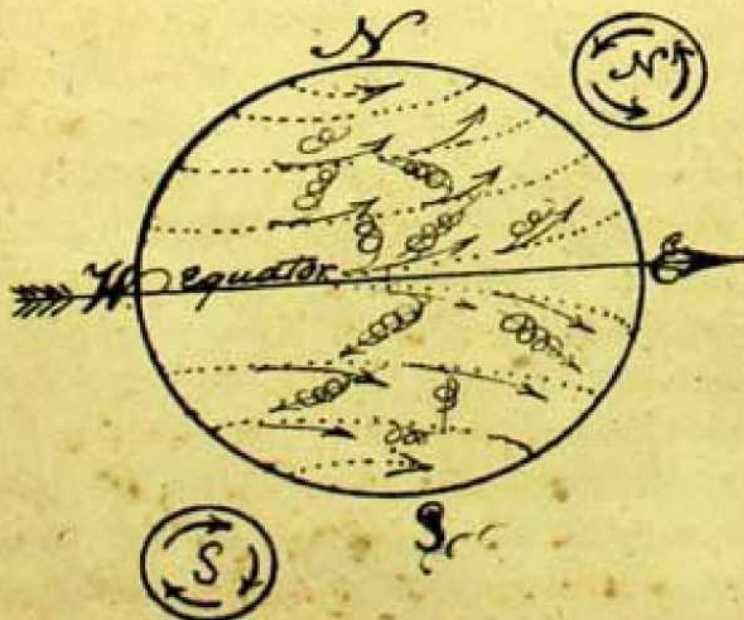
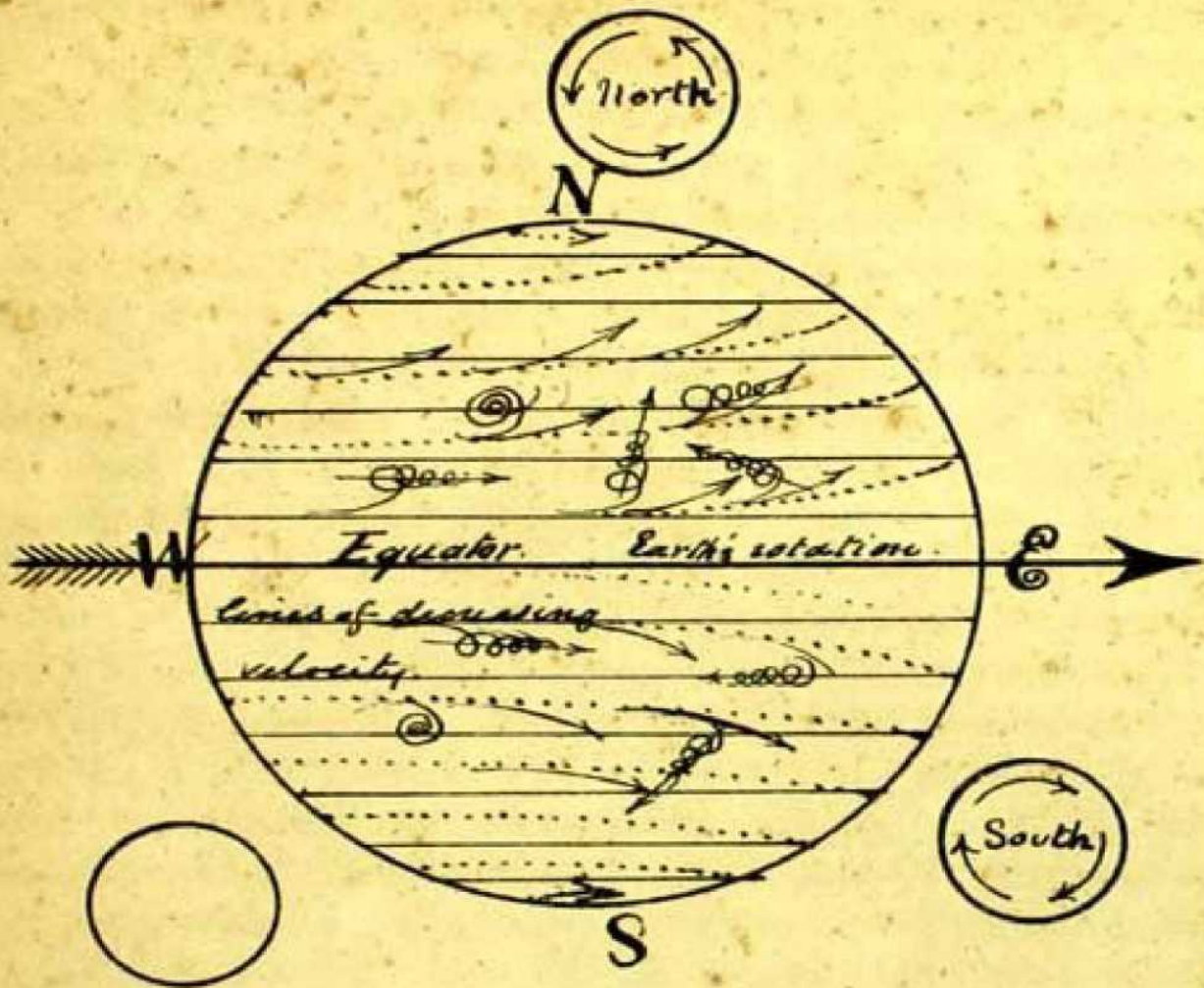
To illustrate this idea of the progression and rotation of a Cyclone in a definite course, spin a tee-totum provided with a glass tube drawn out to a fine point, containing ink, on paper laid perfectly flat.

When the tee-totum is what boys call asleep, give it a slight puff with the breath, horizontally ; this will cause an obliquity of the axis of rotation, and at once induce a revolving motion, and also a progressive one in some particular direction ; and the toy will be found to describe exactly the peculiar motions of the Cyclone, both rotatory and progressive, and by spinning it one way or the other, familiar illustrations may be afforded of the manner in which a Rotatory storm works in the Northern and Southern Hemispheres.

An explanation of the law of the rotations may be attempted thus.—

The rapidity of the earth's diurnal rotation from west to east,







gradually declines from the equator to the poles—on the equator alone, it will be equable ; but on the either side of it, North and South, the force of rotation will constantly diminish towards the poles.

Matter floating in the atmosphere will doubtless be influenced by this rotation of the earth, and have communicated to it, a tendency to deviate from a direct parallel line with the equator:—

The line so formed will, if traced, form an ascending or descending spiral towards the North and South poles, as described in the dotted lines of Plate 4.

For the Northern Hemisphere this line will form an upward spiral from right to left—or against the hands of a watch—and in the Southern Hemisphere, the spiral will move in a contrary way, viz. from left to right or with the hands of a watch—coinciding with the known evolutions of these storms on either side of the equator.

This then may exhibit something of the element we require in order to give these Cyclones their respective rotatory motions.

But their impetus, and direction when in contact with the earth's surface, will perhaps depend on other causes, the operation of which, though slight, may be sufficient to determine the size of their revolutions and the direction of their track—Plate 4 is intended to illustrate this idea.

The arrow represents the Equator, and the earth's diurnal rotation, from west to east. The dotted lines, mark the tendency of bodies floating in the atmosphere to be drawn towards the poles.

The spirals are Cyclones ; and the curved arrows with dotted lines, the element that gives them tendency to revolve either to right or left.

#### *Additional Notes.*

More extended observations on dust whirlwinds and other meteorological phenomena, confirm me in the belief that all kinds of storms, especially those of a distinct rotatory character, are occasioned by electrical Spirals, of which mention was made in my former paper.

What the exact nature of those spirals is, I cannot say—possibly some modification of matter not yet fully noticed ; and they may be identical with the electro-magnetic cylindrical-beams supposed by the late Dr. Dalton to compose the Aurora.—Vide Note 2.

As they are transparent, their existence can only be inferred by the effect produced on surrounding matter, as in the case of the water



spout and the dust whirlwind ; which are familiar instances of their effects when passing over water or a dry sandy soil : but during a storm, when the whole atmosphere is filled with dust, or aqueous vapour, no such marked indication of their presence, is perceptible.

On such occasions however, the peculiar motions of a vane, oscillating as it constantly does from 3 to 4 points, or more, during the passing gusts, marks plainly enough the action of these spirals.

This peculiar motion of a vane during a storm, may perhaps be accounted for, by supposing that the electrical whirls or the eddies caused by them in passing, strike it on one side, and twist it round to a certain distance ; when it is immediately brought back to its original position in the direction of the storm's course, by winds that closely follow after, excited by the passage of the electrical whirl through the air, setting it in motion, and causing winds, blowing with more or less obliquity to a certain distance on either side of the track of the spiral, just as we observe still water is affected by a solid body drawn through it.

This phenomenon I have invariably found to accompany the passage of dust whirlwinds over a vane, and as it is presumed the active portion of rotatory storms, (and probably of all storms,) is composed of a mass of swiftly moving spirals of a similar nature, the same effect on the surrounding air, observable in the small whirls, will likewise be produced on a much larger scale, in every variety of Cyclone or Tornado.

The combined action of both forces, viz. the spiral motion of the body of the storm, or electrical zone, gyrating onwards and from above downwards, and its local effect upon the air through which it passes will produce a curved progressive motion in the winds, taken as a whole, as described by Colonel Reid and Mr. Piddington—and ships caught in its vortex, may be impelled round and round with the body of the storm, as was proved long ago by the latter gentleman to have happened to the brig *Charles Heddle* in the Mauritius Hurricane of 1845.

Reflecting on the spiral working of the storm throughout, it is easy to conceive why the central portion of it, should be so much more violent, than at the outer margin, and why the incurving winds and powerful vortices, so marked thereabouts, render the condition of a



ship so situated, perilous in the extreme, especially, if once involved in the fatal calm centre.

At sea, during such storm, and near its centre, an adequate explanation is now afforded to account for the horribly confused pyramidal masses of raging waters driven by the fierce impetuosity of the winds one against the other, shooting up into the sky, and how on land, such a whirlwind passing over a country, may prove a desolating hurricane, sweeping it literally with the besom of destruction.

In addition to the curved motion of the winds, taken as a whole, there must be, what I have observed in the small whirlwinds, straight-lined winds, blowing around and towards the electrical zone forming the body of the storm; the extent and force of which will probably depend upon the amount or intensity of the electrical matter evolved, and also upon the rapidity of the rotatory and progressive motions, liable therefore to endless variety.

The active portion of all rotatory storms seems to be a stratum of electro-magnetic spirals diverted downwards to the earth's surface from the higher regions of the atmosphere, far above the highest clouds; though from the sensible effects being chiefly confined to a few thousand feet above ground the popular idea is, that the storm itself is also limited to that region, and that it does not extend beyond the cumulo-stratus, or the storm cloud.

If the former supposition be correct, there must be, I think, wherever such a storm is raging, many winds blowing in opposite directions, overlying each other, like steps of a circular staircase, excited by the self-same cause that sets in motion the air below near the earth's surface, though not with an equal degree of force in consequence of the more rarified state of the atmosphere in the higher regions.

The opposite movements of the clouds during a storm seem to indicate, that these varied currents in the higher regions do exist, and as far as my limited experience extends, they do so with such uniformity, that I am inclined to believe that in most, if not in all storms, these opposite movements in the different cloud strata are present, though from the great height of the cirrus cloud any motion affecting it is detected with difficulty, requiring a strong and practical eye to do so, even when marked upon a clear sky without intervening clouds: the difficulty however is greatly enhanced, when during a storm, from the



clouded state of the atmosphere, occasional glimpses only of the upper cloud strata can be caught; and the difficulty becomes an impossibility at sea, from the motion of the vessel: accordingly, these distant clouds, appear under such circumstances, to be stationary, and are often so reported.

## NOTES.

1.—The following account by Captain Gastrell of the effects produced upon an Electro-magnetic battery in action during the passage of a Dust-Storm, will be read with interest.

“I have the pleasure to send you a Memo. of the phenomenon I mentioned to you as observed by me at Cawnpore, with the Electro-magnetic machine during the passage of a Dust-Storm.

“In the hot weather of 1847, I was experimenting one day at about 11 A. M. with an Electro-magnetic machine. It was of small size,—the wire coil about 200 yards in length and fine,—the battery I was using to impel the magnet in the break cup, was one of 12 or 16 pairs of zinc and copper plates; each plate about 4 inches square, and was charged with dilute sulphuric acid and water. Shortly after the battery and magnet were in action, and sparks passing freely, a dust-storm came up from the West, passing directly over the house I was in towards the N. E. or E. N. E.

“On its approach, I observed the action of the magnet decrease gradually, until, in the dead lull or calm that usually precedes such storms, it ceased revolving.

“The action of the battery during the same period increased in intensity and apparently in proportion to the decreased revolutions of the magnet.

“It was at its maximum of intensity about the time the centre of the storm was passing, and, supposing the stoppage of the magnet might be owing to too much energy in the battery, I disconnected the coil, and placed it in connection with a single cell battery with platina plates.

“This I charged with a solution of sulphuric acid and water, decreasing the strength of the solution with more water from time to time, but with no effect on the magnet. I then emptied the cell, and charged it with a solution of common salt and water, with the same want of success: I then removed the single cell battery, and re-connected the coil with the 12 plate battery, and left it.

“No sooner had the storm of dust passed, and light rain began to



fall, than the action of the battery became quieter, until the hissing sound ceased, and the magnet again began to revolve: sparks of course passed, and shortly the magnet revolved as quickly as it did previous to the storm.

"I mentioned the circumstance to my cousin Colonel Wilson, astronomer at Lucknow, and asked him if he had ever seen a similar circumstance mentioned; or, if he had ever observed his magnets in the magnetic observatory at Lucknow in any way affected during the passage of a dust storm. He replied he had not, and could not account for it in any way. Query. Is there any point in the track of these dust storms, (which are undoubtedly of the nature of Cyclones) in which, if a magnet happened to be, it would lose its polarity for the time, ceasing to be a magnet?

"If so, the cause would be clear. This did not strike me at the time, or I might have easily tested it.

"I recollect another phenomenon observed in one of these storms. It occurred during the march of my Regiment up-country to join the army of the Punjaub. We had left our ground long before day-light, and were caught in a dust-storm, followed by very heavy rain and vivid lightning; when the rain fell, the muzzles of the men's muskets, and the peaks of the officers' caps, were seen tipped with that well known electrical appearance, called St. Elmo's light: and this appearance continued for some minutes, a quarter of an hour perhaps. I am not quite sure now, whether I ought not to say, the *tips of the Bayonets*, and not, the muzzles; as we were marching with treasure, and, I think, Bayonets fixed."

2.—In Noad's Lectures on Electricity, page 337, the following passage occurs.

"Dr. Dalton, in a work published in 1793, has advanced several ingenious hypothetical views respecting the cause of the Aurora, and its magnetic influence. He says,

"We are under the necessity of considering the *beams* of the *Aurora borealis* of a *ferruginous* nature, because nothing else is known to be magnetic; and consequently that there exists in the higher region of the atmosphere, an electric fluid partaking of the properties of iron, or rather of *magnetic steel*; and that this fluid, doubtless from its magnetic property, assumes the form of cylindrical beams.' "



*Nooks and Corners of Bengal.—No. I. The Tomb of MEER MUDDAN KHAN, Commander-in-Chief of the NUWAB SOORAJ-ODD-DOWLAH's Army at the Battle of Plassy.*

The traveller in marching from Kishnuggur to Berhampore by the Darjeeling Road, after leaving the quiet little thatched hut constituting the Post Office at Miria or Merai, enters upon the open and level-plains, leading to Plassy. Little beyond proud reminiscences of the glorious day on which Clive added the richest jewel to the crown of Britain needs detain him on his journey. One huge and venerable mango tree alone remains, of the grove, under whose shelter, the small band of British Troops encamped on the memorable night, preceding the Battle. Stewart in his History of Bengal, says, "At sunset, the Troops got under arms, and after a fatiguing march, arrived at one o'clock in the morning at Plassy, and immediately took possession of a mango grove 800 yards in length and 300 in breadth."

The encroachments of the River Bhagirutti and the hatchet of the wood-cutter have gradually reduced this once extensive grove to the single tree now standing, to point out the site of the contested field of the 23rd June, 1757! The villagers appear to regard the old tree with much veneration, and offer under its shade, little clay images of horses to their gooroo or saint: these little clay horses, in great number, cover the ground, mixed with the green and brushwood.

Cannon shot and fragments of rusty arms are occasionally turned up by the plough and carried off to the neighbouring Indigo Factories, where they meet with a ready sale.

Continuing his steps towards the village of Locknathpore, the traveller may remark a single tree on the left of the road, a few hundred yards distant, surrounded by low underwood. This is Juggut Roy's tree and the last remains of his garden. Juggut Roy was the owner of Plassy grove, who removed his residence, in consequence of the encroachments of the river, to this spot. The house is no longer standing; loose bricks overgrown with wild flowers and degenerated garden creepers and plants, shadowed by the lonely tree, mark the site of the grounds; the plough is daily adding even these to the surrounding level monotony of the increasing cultivation.

At a distance of about a mile and a half north from Locknathpore,



is the village of Mungunpára, situated on the banks of the river and buried in trees. To the northern end of this village rises a tall Fan Palm, visible far away along the dreary road between Miria and Dáoudpore. This Palm indicates the Durgâh of Faqeer Shah Fareed Shukr Gunge,\* a Durvesh of much note and sanctity who travelled throughout the continent of India, marking his various resting places, by the erection of holy shrines of worship. The Durvesh died and was buried in the Punjab, where his memory is held in much esteem.

Ferishtah, who wrote his history, the Tarikh-i-Ferishta, about the year A. D. 1593, mentions that in the year 472 H. (A. D. 1055,) the Sultan Ibrahim marched in person to India and conquered several new cities; amongst them, Ajudhan, now called Puttun Sheik Fureed Shukr Gunge, which is in all probability the burial place of the Durvesh. It lies between the rivers Jhelum and Indus, and is supposed by Wilford to be the same as the Hud of the Book of Esther. On the Allahabad Lát or Column it is mentioned under the name of *Yaudheya* and occurs also on many Bactro-Pehlevi coins.†

The Durgâh at Mungunpára is a simple square brick building on a raised *chubootra* or terrace, surmounted by a bell-shaped cupola, all brightly white-washed and cleanly swept, and surrounded by trees, within an enclosure having entrances to the east and west.

On the western side of the building, uncared for and neglected, a few feet above the level of the damp green earth and shaded by over-hanging branches, stands a small unpretending brick grave, showing the last resting place of a brave and faithful soldier, Meer Muddan Khan, Commander-in-chief of the army of the Nuwab Sooraj-ood-Dowlah at the Battle of Plassy, who was killed by a cannon shot which carried off both legs, about 12 o'clock on the day of action.

I can find no mention of Meer Muddan earlier than the year 1756,‡ when he appears to have been selected, although a man of mean origin,

\* His name was according to Dára-Shikóh's *Safynat alawliyyá*, Mas'úd 'azyzaldyn b. Moámúd. He was born at Khólwál كهولوال which is not far from Multán and was a pupil of Qotbaldyn Bakhtiyár. The name of Ganjyshakr, i. e. treasury of Sugar, was given to him by his spiritual guide because one day, having fasted a whole week, he fainted in the street and some mud which had fallen on his mouth, during the swoon was miraculously converted into sugar. He died at an age of 95 years in A. H. 664, (A. D. 1265, 17th Oct.) He was buried at a place between Lahore and Multán.—Ed.

† Journal A. S. of Bengal, Vol. VI. p. 973.

‡ Stewart's Hist. Beng. p. 309.



by Sooraj-ood-Dowlah, from amongst the companions of his pleasures for the important post of Commander-in-chief of his forces ; to the exclusion and supercession of the old officers under the late government of Ali Verdi Khan.

There can be little doubt but that Meer Muddan commanded in all the eventful operations, which marked the short reign of the vicious and depraved Nuwab, so much despised for his crimes and his cowardice. Orme\* describes Meer Muddan as one of the best and most faithful of the Nuwab's Generals.

Stewart in his account of the Battle of Plassy, when describing the suspicions of Clive as to the intentions of the traitor Meer Jaffier, states that the agent, one Ameer Beg, on being sent for and questioned as to what troops were opposed to the English, replied, those under Meer Muddan and Rájá Mohun Lall, consisting of 5000 Horse and 7000 Foot.

Sooraj-ood-Dowlah with his accustomed cowardice remained out of danger in his tent, which must have been pitched near the village of Mungunpara, distant a little more than a mile north of the field of battle. There he sat, listening to the continual flatteries of his courtiers, who were assuring him of victory, until the mutilated body of his faithful General was carried into his presence. The dying man lived but to utter a few words expressive of his own loyalty and the want of it in others, and died at the feet of his unworthy master.

The sketch† heading this short notice of one of the interesting "Nooks and Corners" of Bengal was taken during the cold weather of 1851-52. The modest brick grave of the brave soldier is fast falling to decay, whilst at Khooshbagh near Moorshedabad the tomb of the vicious and cowardly Nuwab Sooraj-ood-Dowlah, renowned for his atrocities, and whose memory is held in universal detestation, in connection with the fearful tragedy of the "*Black-hole*" of Calcutta, is repaired and kept up at the expense of Government, with a most liberal establishment of Moollahs, Gardeners, Masons, &c. &c. !

Would not a few Rupees be sanctioned to save this little spot, sacred in Indian history, from speedily becoming a ruin and a mass of rubbish ?‡

\* Orme's Hist. of Hindostan, Vol. 2, page 175.

† It was not found feasible to print the sketch.—Ed.

‡ Since the above was written the tomb has been repaired at the expense of Henry Torrens, Esq. Agent to the Governor General, at Moorshedabad.



(Continued from page 48.)

No.	Genus.	Species.	Native Names.	Remarks.
	..	Sub avicularia Dryan- dri.	..	Dried up mud.
	Rumex.	Wallichiana.	..	Bed of Ken.
	LAURINEÆ.			
	Cassytha.	..	..	Bushy places.
	EUPHORBIACEÆ.			
	Emblica.	Officinalis.	..	Gardens.
550	Phyllanthus.	Simplex.	..	Fields and rocks, &c.
	..	Obovatus.	..	Fields.
	..	Niruri.	..	Cultivated ground.
	..	Vitis idæa.	..	Rocky thickets.
555	..	..	..	Ditto Kurtul.
	Melanthesa.	..	..	Banks of Cane.
	Briedelia.	..	..	Gardens.
	Crozaphora.	..	..	Jungles.
	..	Plicata.	..	Abundant,—black soil.
560	Baliospermum.	Tinctoria.	..	Ditto.
	Ricinus.	Indicum.	..	Abundant.
	Acalypha.	Communis.	..	Cultivated.
	Euphorbium.	..	..	Rocks, Banda.
	..	Neriifolium.	..	Gardens.
565	..	..	..	Black soil.
	..	Hirtum.	..	Abundant.



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
570	..	Glaucum.	..	Abundant.
	..	(Villose.)	..	Banks of Cane.
	..	Chamesyee.	..	Common.
	..	..	..	Ditto.
	..	Dracunculoides.	..	Fields.
	..	..	..	Ditto.
	..	..	..	Banks of ditches, &c.
575	Rottlera.	Tinctoria.	Rori.	Jungles.
	PIPERACEÆ.	Betel.	Pán.	Cultivated near Seonda.
	Piper.	..	..	Damp rocks—abundant, &c.
	ULMACEÆ.	Integrifolia.	Chilla.	Abundant, cultivated and wild.
	Ulmus.	Colebrookii.	Khusam.	Kuliangarh hills.
580	JUGLANDÆÆ.	Lakoocha.	Barhal.	Gardens.
	Engelhaertia.	Integrifolia.	Kathal.	In a garden at Chitarkot.
	ARTOCARPEÆ.	Indica.	Bar.	Passim.
	URTICACEÆ.	Laccifera?	Ditto.	Kaliangarh hills.
	Artocarpus.	Tomentosa.	Ditto.	Granite rocks Banda.





585	.. .. .. .. .. .. .. .. Epicarpurus. 590 Pezizoo. SALICINÆ. Salix. .. An Myricaceous. An Rhus? An Pterospermum. 595 Byttneriaceæ? A climbing plant (woody.) Strychnos? A climbing shrub— shining acuminate lanceolated dark green leaves, young leaves rusty. ENDOGENÆ. PALMÆ. Phoenix. 600 Borassus.	.. Religiosa. Infectoria. Ampelos. Oppositifolia. Heterophylla. Carica. Aspera. Hispidula. Tetrasperma. Doubtful. .. .. .. With stellate carpels. .. .. .. .. .. Sylvestris. Flabelliformis.	.. Gular. Pipal. Pákar. .. .. .. .. .. .. Bet. .. .. Robin. Kapsia. Bhoti. Prit Bhanjan. Kápar. .. .. .. Khajur. Tar.	Cultivated. Passim. Rare (Chytára.) Rocky hills—Chitarkot. Waterfalls, &c. Gurhrampur. Bed of Ken—Ramgarh. Gardens. Not uncommon. Very large at Nehi. Sides of streams—Kulhunuán. Ken at Ramgarh. Ditto. Kaliangarh jungles. Ibid. Ditto. Ditto. Ditto. Ditto. Rocks at Dasratkund, P. Chibun. Rare, cultivated. Very rare.
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## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
	PANDANEÆ. Pandanus.	Odoratissimus.	Keora.	Rare,—gardens.
	AROIDEÆ. Colocasia.	Nymphœifolia. Antiquorum.	.. Arwi.	Near Reonetri. Cultivated,—gardens.
	LEMNACEÆ. Lemna.	Gibba ?	..	Ponds.
	NAIADACEÆ. Aponogeton.	Monostachys. Palustris.	.. ..	Rare (ponds) Gureb. Ditto.
	MUSACEÆ. Musa.	Sapientum.	Kela.	Gardens.
	CANNACEÆ. Canna.	Indica.	..	Ditto.
	ZINGIBERACEÆ. Zingiber.	Officinale. Capitatum.	Adrak. Haldi.	Cultivated,—rare. Jungles (Rasaure.) Cultivated,—rare.
610	Z. Curcuma.	Longa.	..	Turf—banks of brooks.
	ORCHIDEÆ. Zeuxine.	Sulcata. Sp.	.. ..	Only seen in point Kaliangarh jungles, &c.— Gurhampur.
	Dendrobium.			



AMARYLLID.E.	Kanthala.	..	Gardens.
Agave.	Zeylanicum.	..	Ib.
615 Pancratium.	Verecundum.	..	Ditto.
..	Zeylanicum.	..	Gardens.
Crinum.	Toxicarium ?	..	Marshes—I have not seen this flower.
..	Tazetta ?	..	Gardens.
620 Narcissus.	Perrica.	..	Gardens.
IRID.E.	Chinensis.	..	Ditto.
Iris.	Octandra.	..	Ponds.
Pardanthus.	Spiralis.	..	Ditto.
Blyxa.	Albemifolia.	..	Ditto.
Vallisneria.	Verticellata.	..	Ditto.
625 Hydrilla.	Alata.	Jhanghi.	
Dioscore.E.	Sagittata.	Ratalú.	Cultivated.
Dioscorea.	Pentaphylla.	..	Rocks.
..	Taberosa.	..	Jungles.
LILIACE.E.	Indica.	Ghikonwar.	Gardens.
630 Polyanthes.	Gloriosa.	..	Cultivated.
Aloe.	Sativum.	..	Gardens.
Yucca.	Cepa.	Lahsan.	Ditto.
Allium.	Clavatus.	Pyaz.	Ditto.
..	Fulva.	Pyazi.	Wild in corn fields.
635 Asphodelus.	Officinalis.	Gulnargis.	Gardens.
Hemerocallis.	Superba.	Kúrihári.	Ditto.
Asparagus.			Jungles.
Gloriosa.			



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
	JUNCACEÆ. Juncus.	Dichotomus.	..	Marshy ground.
	ALISMACEÆ. Sagittaria.	Sagittata.	..	Ponds—khundah.
640	S.	Cordata.	..	Ib.
	COMMELYNACEÆ. Commelyna.	Bengalensis.	..	Rubble.
	C.	Salicifolia?	..	Ditto.
	C.	Gelatinosa, N. S.	..	Rocks.
645	Cyanotis.	Axillaris.	..	Marshy ground.
	C.	Imbricata.	..	Ib.
	Aneilema.	Spiratum.	..	Waste places—dry.
	A.	Nudiflora.	..	Grassy places.
	ERIOCAULONEÆ. Eriocaulon.	Sexangulare.	..	Moist ground.
	CYPERACEÆ. Cyperus.	Pectiniformis.	..	Sandy ground.
650		Nivea.	..	Abundant.
	..	Aristatus.	..	Sandy ground.
	..	Hexastachyus.	..	Too abundant.
	..	Irio.	..	Rice fields, &c.
655	..	Wightii?	..	Spring heads—Ken banks.



Isoplepis.	..	Venustus.	..	Wet ground.
Scirpus.	..	Roylei.	..	Wet places.
660 Malacochaete.		Barbata.	..	Sandy fields.
Elæocharis.		Affinis.	..	Wet ground.
HYDROCHARIDÆ.		Pectinata, Nov.	..	Edges of streams.
GRAMINA.		Palustris.	..	Marshes.
PANICEÆ.				
Paspalum.		Srobiculatum.	Kodon.	Cultivated.
P.		Longiflorum.		Marshes.
P.	N. S	Biflorum.		Shady places.
665 P.		Pedicellatum.		Sandy fields.
Helopus.		Annulatus, Nov. MS.		Common.
Panicum.		Brizoides Roxb.		Black soil,—abundant.
		Flavidum.	Sawank.	Poor soil.
		Colonum.		Fields, &c.
670 P.		Concinnum.		Ib.
P.		Setigerum.		Rocks.
P.		Vestitum.		Fields.
P.		Angustatum.	Kora.	Ib.
675 P.		..		Ditto.
P.		Helopus, (Nov.)		Rocks.
P.		Triflorum.	Sawank.	Cultivated.
P.		Frumentaceum.	Jal sawank.	Wet places—ditches.
P.		Hispidulum.		Hedges and thickets.
680 P.		Antidotale.	..	Cultivated in gardens—rare.
		Maximum.	..	



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
	Panicum.	Paludosum.	..	Ponds.
	..	Roxburghii.	Jangli chiní.	Fields.
	..	Miliaceum.	China.	Cultivated.
	..	Miliare.	Kutki.	Cultivated in the Patha.
685	Digitaria.	Commutata.	Thakhriya.	Abundant.
	..	Royleana.	..	Sandy fields.
	..	Cruciata.	..	Fields.
	..	Appressa.	..	Fields (Sandy.)
	..	Cimicina.	..	Fields.
690	Coridochloa.	Helvola.	..	
	..	( <i>Glaucia Roxb.</i> )	..	Abundant,—poor soil.
	Setaria.	Italica.	Kákún.	Cultivated.
	..	Rottleri.	..	Shady places.
	..	( <i>Tomentosa.</i> )	..	
695	..	Verticellata.	..	Ditto gardens, &c.
	Echinochloa.	Stagnina.	Nari.	Wet places.
	Orthopogon.	Burmanni.	..	Grass.
	Penicillaria.	Spicata.	Bujra.	Cultivated.
	Pennisetum.	Holcoide.	..	Rocky jungles—Gurhampur.
	..	Araneosum.	..	Ib.—Banda.
700	..	Imberbe.	..	Ib.—Gurhampur.
	Ceneterus.	Echinoides, Nov. MS.	..	Sandy moist ground.
	..	Montanus.	..	Ib.



Lappago.	Biflorus.	..	Ib.	Damp ground—edges of stream.
ANDROPOGONEÆ.	Kœnigi.	..		Near the Jumna.
Imperata.	Sara.	Sirpat-Múnj.		Passim. The curse of the country.
705 Saccharum.	Spontaneum.	Kánsa.		Cultivated.
..	Officinale.	Ganna.		Banda rocks.
..	Tenue.	..		Inundated lands.
Pogonetherum.	Muricata.	Orai Gándr.		Cultivated.
Vitiveria.	Vulgare.	Sentha.		Thickets.
710 Sorghum.	Halepense ?	Joár.		Beds of rivers, among rocks.
..	Giganteum.	Barú.		Rocks.
..	Cærulea.	..		Rocky woods.
..	Microstachys ?	..		Kaliangarh.
715 ..	Aciculatus ?	..		Rocks.
Andropogon.	Echinatus.	..		Poor gravelly soil, Seonda.
..	Tenellus.	..		Pastures.
..	Bladhii.	Donda.		Thickets.
..	Scandens.	..		Pastures.
720 ..	Pertusus.	..		Ib.
..	Orthos (strictus.)	Rúkar.		Rocky jungles.
..	Ischæmum.	..		Ibid.—Gurhampur.
..	Pumilus.	..		Abundant—pastures.
725 ..	Martini.	..		Rare—Rasaura, Kaliangarh.
..	Schænanthus.	..		Cultivated.
..	Contortum.	..		Pastures—very abundant spear grass.
Heteropogon.	..	Parba.		Pastures—a very useful grass.
Anthistiria.	..	Musel.		Marshes.
..	Cimicina.	..		



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
730	..	Prostrata.	..	Moist pasture.
	..	Scandens, Roxb.	Bhaunr.	Pastures—coarse, refused by cattle.
	Apluda.	Aristata.	Bhanjuri.	Thickets.
	STIPEÆ.			
	Aristida.			
	..	Hystrix?	Sarfi.	Pastures—and dry ground.
	..	Setacea?	..	Ib.
	..	Funicularis?	..	Ditto.
735	AGROSTIDÆ.			
	Polypogon.	Crinitus.	..	Moist places.
	Sporolobus.	Tenacissima?	..	Fields.
	..	Coromandeliana.	..	Ditto.
	PHLEOIDEÆ.			
	Perotis.	Latifolia.	..	..
	OLYREÆ.			
740	Coix.	Lachryma?	..	Marshes.
	..	Barbata.	..	Rocky thickets.
	CHLORIDÆ.			
	Chloris.	Roxburghii.	..	Thickets.
	..	Melica digitata, Roxb.		
	C.	Decora, E. MS.	Gulphulni.	Pastures—abundant.
	Eleusine.	Coracana.	Mandua.	Cultivated.
745	Leptochloa.	Filiformis.	..	Shady places..





745	<i>Dactyloctenium</i> .	<i>Ægyptiacum</i> .	Makora.	Waste places.
	<i>Cynodon</i> .	<i>Dactylon</i> .	Dhúb.	Abundant.
	<i>Dinebra</i> .	<i>Verticillata</i> .	..	New ground, gardens.
	<i>Schrenkfoldia</i> .	<i>Pallida</i> , N. S.	..	Dry barren ground.
	<i>Melanocluchris</i> .	<i>Monaca</i> .	..	Ibid.
750	<i>Leptochloa</i> ?	<i>Calycina</i> .	..	Rich black soil.
	<i>HORDEE.</i>			
	<i>Hordeum</i> .	<i>Hexastachyon</i> .	Jau.	Cultivated.
	<i>Triticum</i> .	<i>Æstivum</i> .	Gihun.	Ditto.
	<i>ROTBOLLIE.</i>			
	<i>Meorchium</i> .	<i>Rugosum</i> .	..	Black soil.
	<i>Mnesithea</i> .	<i>Lævis</i> .	..	Rich moist pasture.
755	<i>Hemarthra</i> .	<i>Fasciculata</i> .	..	Ib.
	<i>Ophiurus</i> .	<i>Corymbosus</i> .	Sonta.	Black soil.
	<i>Rotbollia</i> .	<i>Exaltata</i> .	..	Rich soil—edges of fields.
	<i>Manisurus</i> .	<i>Granulatus</i> .	..	Rocks or gravelly ground.
	<i>Oropetium</i> .	<i>Thomæa</i> .	..	Ibid.
760	<i>ARUNDINE.</i>		..	
	<i>Arundo</i> .	<i>Karka</i> .	..	Hedges, &c.
	<i>Thysanolaena</i> .	..	..	Rocks—Gurhampur.
	<i>POE.</i>			
	<i>Poa</i> .	<i>Annua</i> ?	Chirua.	Walks, &c.
	<i>Eragrostis</i> .	<i>Bifaria</i> .	..	Rocks.
	..	<i>Plumosa</i> .	..	Fields.
	..		..	Ditto.
765	..	<i>Diandra</i> .	..	Rocks.
	..	..	..	Ditto.
	..	..	..	Ditto.



## Catalogue of plants found in the Banda district, 1847—49.

No.	Genus.	Species.	Native Names.	Remarks.
770	..	Nutans, Roxb.	..	Black soil.
	..	..	..	Edges of ponds.
	..	..	..	Fields—very common.
	..	Flexuosa?	Daulphuli.	Ditto.
	..	Riparia.	..	Edges of streams.
775	..	Multiflora, Roxb.	..	Sandy places.
	..	Cynosyroides.	Dabri.	Low ground—abundant.
	..	Articulata.	..	Ponds—rice fields, &c.
	Elytrophorus.	Stricta.	Bans.	Rocky hills.
	BAMBUSEÆ.	Sativa.	Dhán.	Cultivated.
780	Bambusa.	Aristata.	..	Ponds.
	ORYZÆ.	Quadrifoliata.	..	Pools.
	Oryza.	Debile.	..	Fields.
	Seersia.	Verticellata.	..	Rivers, &c.
	RHIZOSPERMEÆ.	Imbricata.	..	Ponds—streams.
	Marsilea.	..	..	Sandstone rocks—Patha.
	EQUISETACEÆ.	..	..	..
	Equisetum.	..	..	..
	CHARACEÆ.	..	..	..
	Chara.	..	..	..
	SALVINIACEÆ.	..	..	..
	Azolla.	..	..	..
	LYCOPODIACEÆ.	..	..	..
	Selaginella.	..	..	..



POLYPODIACEÆ.			
785 Polypodium.	Proliferum.	..	Damp rocks—Kaliangarh as Abharkan—Bhiradhkund.
Nephrodium.	Unitum.	..	Ibid.
Pteris.	An Molle, Roxb.?	..	Ditto.
	Amplectens.	..	Dry rocks and walls.
	Radiatus.	..	Ditto.
	Vestitum.	..	Wells—wet rocks.
790 A. Cheilanthes.	Capillus Veneris.	..	Dry rocks.
BRYACEÆ.	Dealbata.	..	Wet rocks—Bhedak and Abharkan.
Hyprum.	..	..	Damp earth—common.
Phascum.	..	..	





	Banda.			Sikh States.			Multan.		
	Wild.	Culti- vated.	Total.	Wild.	Culti- vated.	Total.	Wild.	Culti- vated.	Total.
Ranunculaceæ, . . . .	1	1	2	3	2	5	1	2	3
Annonaceæ, . . . . .	1?	1	1	..	..	..	..	..	..
Magnoliaceæ, . . . . .	..	1	1	..	..	..	..	..	..
Menispermaceæ, . . . .	3	..	3	2	..	2	1	1	2
Nymphæaceæ, . . . . .	1	..	1	2	..	2	1	0	1
Nelumbaneæ, . . . . .	1	..	1	1	1	1	1	1	13
Papaveraceæ, with Fu- mariaceæ, . . . . .	2	1	3	1	2	3	4	2	5
Cruciferae, . . . . .	1	7	8	3	6	11	7	6	13
Capparideæ, . . . . .	8	..	8	5	1	6	6	1	7
Resedaceæ, . . . . .	..	..	0	1	..	1	1	..	1
Flacourtiaceæ, . . . .	1	..	1	1	..	1	..	..	..
Violaceæ, . . . . .	1	..	1	1	..	1	..	..	..
Polygalaceæ, . . . . .	2	..	2	2	..	2	1	..	1
Frankeniaceæ, . . . .	..	..	..	..	..	..	1	..	1
Elatinaceæ, . . . . .	1	..	1	2	..	2	1	..	1
Tamariscineæ, . . . . .	1	..	1	1	1	2	3	..	3
Caryophyllaceæ, with Elleutraceæ, . . . .	3	..	3	7	1	8	5	..	5
Lineæ, . . . . .	..	1	1	..	1	1	..	..	..
Malvaceæ, . . . . .	19	6	25	11	4	15	5	3	8
Bombaceæ, . . . . .	1	1	1	1	1	1	..	..	..
Byttneriaceæ, . . . . .	4	1	4	2	1	3	..	..	..
Tiliaceæ, . . . . .	13	1	13	9	1	10	6	1	7
Cistineæ, . . . . .	1	..	1	..	..	..	..	..	..
Aurantiaceæ, . . . . .	2	7	7	1	5	6	0	6	6
Malphigiaceæ, . . . .	1	1	2	..	..	..	..	..	..
Sapindaceæ, . . . . .	1	1	2	1	..	1	..	..	..
Meliaceæ, . . . . .	1	2	2	..	3	3	..	2	2
Cedrelaceæ, . . . . .	..	..	..	..	1	1	..	..	..
Ampelideæ, . . . . .	3	1	4	2	1	3	1	1	2
Oxalideæ, . . . . .	2	1	3	1	1	2	1	..	1
Balsamineæ, . . . . .	0	1	1	0	1	1	0	1	1
Zygophylleæ, . . . . .	2	0	2	2	0	2	4	0	4
Xanthoxylaceæ, . . . .	..	1	1	..	..	..	..	..	..
Rutaceæ, . . . . .	..	..	..	1	..	1	1	..	1
Celastimeæ, . . . . .	2	..	2	1	..	1	..	..	..
Rhamnaceæ, . . . . .	5	1	6	2	1	3	5	..	5
Samydaceæ, . . . . .	..	..	..	2	..	2	..	..	..
Anaiardiaceæ, . . . . .	5	1	6	..	2	2	..	1	1
Moringaceæ, . . . . .	..	1	1	..	1	1	..	1	1
Papilionaceæ, . . . . .	70	20	90	29	18	57	26	13	39
Cæsalpinieæ, . . . . .	7	6	12	6	6	12	..	3	3





	Banda.			Sikh States.			Multan.		
	Wild.	Culti- vated.	Total.	Wild.	Culti- vated.	Total.	Wild.	Culti- vated.	Total.
Mimoseæ, . . . . .	10	3	13	7	2	9	3	1	4
Rosaceæ, . . . . .	1	1	2	2	8	10	1	6	7
Combretaceæ, . . . . .	7	1	7	..	1	1	..	..	..
Granatææ, . . . . .	..	1	1	..	1	1	..	1	1
Onagrariææ, . . . . .	2	1	3	5	..	5	..	..	..
Lythraciææ, . . . . .	7	1	8	7	1	8	..	1	..
Alangiæææ, . . . . .	1	..	1	..	..	..	..	..	..
Myrtaceæ, . . . . .	1	3	4	..	2	2	..	2	2
Cucurbitaceæ, . . . . .	10	10	20	8	9	17	3	11	14
Portulacaceæ, . . . . .	3	1	3	5	1	5	6	1	6
Ficoideæ, . . . . .	..	..	..	1	..	1	1	..	1
Saxifragaceæ, . . . . .	1	..	1	..	..	..	..	..	..
Umbelliferæ, . . . . .	1	6	7	5	6	9	0	4	4
Loranthaceæ, . . . . .	2	..	2	1	..	1	..	..	..
Rubiaceæ, . . . . .	9	2	11	10	1	11	1	..	1
Compositæ, . . . . .	42	4	46	42	9	51	10	3	13
Campanulaceæ, . . . . .	2	..	2	1	..	1	..	..	..
Lentibulariææ, . . . . .	..	..	..	3	0	3	..	..	..
Primulaceæ, . . . . .	2	..	2	2	..	2	1	..	1
Myssenaceæ, . . . . .	1	..	1	..	..	..	..	..	..
Ebenaceæ, . . . . .	3	..	3	1	..	1	..	..	..
Sapotææ, . . . . .	2	2	3	..	3	3	..	1	1
Jasminaceæ, . . . . .	1	5	5	2	3	5	..	2	3
Apocynaceæ, . . . . .	7	5	11	5	2	7	..	1	1
Asclepiadææ, . . . . .	13	2	15	4	..	4	5	..	5
Gentianææ, . . . . .	6	..	6	4	..	4	1	..	1
Begrimiacææ, . . . . .	4	1	5	1	..	1	1	..	1
Pedulineæ, . . . . .	..	3	3	..	1	1	..	1	1
Convolvulaceæ, . . . . .	19	6	25	14	2	16	6	3	9
Boraginææ, . . . . .	11	1	12	10	2	12	10	2	12
Hydroleaceæ, . . . . .	1	..	1	1	..	1	..	..	..
Scrophulariaceæ, . . . . .	13	..	13	15	..	15	5	..	5
Orobanchææ, . . . . .	1	..	1	2	..	2	2	..	2
Solanææ, . . . . .	6	4	10	6	6	12	7	4	11
Acanthaceæ, . . . . .	30	1	30	18	4	22	..	..	..
Verbenaceæ, . . . . .	4	1	5	7	1	8	1	3	4
Labiataæ, . . . . .	13	4	17	9	3	12	3	3	6
Plumbaginææ, . . . . .	1	..	1	1	..	1	1	..	1
Plantaginææ, . . . . .	..	..	..	1	1	2	1	..	1
Sphenocleaceæ, . . . . .	1	..	1	1	..	1	1	..	1
Salvadoraceæ, . . . . .	0	..	0	1	..	1	2	1	2
Phytolaceæææ, . . . . .	1	..	1	1	..	1	2	..	2
Salsolaceæ, . . . . .	..	4	4	5	4	9	7	2	9



	Banda.			Sikh States.			Multan.		
	Wild.	Culti- vated.	Total.	Wild.	Culti- vated.	Total.	Wild.	Culti- vated.	Total.
Amarantaceæ, . . . . .	7	4	11	9	5	14	10	4	14
Nyctajineæ, . . . . .	2	1	3	2	1	3	4	1	5
Polygonaceæ, . . . . .	4	..	4	9	..	9	2	..	2
Laurineæ, . . . . .	1	..	1	..	..	..	..	..	..
Aristolochiaceæ, . . . . .	1	..	1	..	..	..	..	..	..
Euphorbiaceæ, . . . . .	21	4	25	20	3	23	6	2	8
Piperaceæ, . . . . .	1	1	2	..	..	..	..	..	..
Ulmaceæ, . . . . .	1	..	1	..	..	..	..	..	..
Juglandæ, . . . . .	1	..	1	..	..	..	..	..	..
Urticaceæ, . . . . .	11	3	14	7	3	10	..	6	6
Salicineæ, . . . . .	1	..	1	1	2	3	1	3	4
Myricaceæ, . . . . .	..	..	..	..	1	1	..	..	..
Platanæ, . . . . .	..	..	..	..	1	1	..	..	..
Gnetaceæ, . . . . .	..	..	..	1	..	1	1	..	1
Doubtful, . . . . .	7	..	7	..	..	..	1	..	1
Total Exogens, ..	463	151	605	380	149	526	188	115	302
Palmæ, . . . . .	..	2	2	1	..	1	..	1	1
Pandaneæ, . . . . .	..	1	1	..	..	..	..	..	..
Aroideæ, . . . . .	1	1	2	1	2	3	..	1	..
Lemnaceæ, . . . . .	1	..	1	..	..	..	..	..	..
Typhaceæ, . . . . .	..	..	..	2	..	2	1	..	1
Naiadeæ, . . . . .	2	..	2	4	..	4	..	..	..
Musaceæ, . . . . .	..	1	1	..	1	1	..	1	1
Cannaceæ, . . . . .	..	1	1	..	2	2	..	1	1
Zingiberaceæ, . . . . .	1	2	3	2	..	2	..	..	..
Orchideæ, . . . . .	2	..	2	2	..	2	1	..	1
Amaryllideæ, . . . . .	1	5	6	..	4	4	..	2	2
Irideæ, . . . . .	..	2	2	..	2	2	..	..	..
Hydrocharideæ, . . . . .	4	..	4	2	..	2	..	..	..
Dioscoreæ, . . . . .	2	1	3	1	..	1	..	..	..
Liliaceæ, . . . . .	2	7	9	5	4	9	2	..	2
Juncaceæ, . . . . .	1	..	1	1	..	1	..	..	..
Alismaceæ, . . . . .	2	..	2	5	..	5	..	..	..
Butomaceæ, . . . . .	..	..	..	2	..	2	..	..	..
Commelynaceæ, . . . . .	7	..	7	4	..	4	1	..	1
Eriocauloneæ, . . . . .	1	..	1	1	..	1	..	..	..
Cyperaceæ, . . . . .	12	..	12	35	..	35	3	..	3
Phalarideæ, . . . . .	..	..	..	1	..	1	1	..	1
Paniceæ, . . . . .	33	7	40	38	4	42	12	4	16
Andropogoneæ, . . . . .	26	3	29	16	3	19	9	2	11
Stipaceæ, . . . . .	3	..	3	3	..	3	5	..	5
Agrostideæ, . . . . .	3	..	3	7	..	7	2	..	2





	Banda.			Sikh States.			Multan.		
	Wild.	Culti- vated.	Total.	Wild.	Culti- vated.	Total.	Wild.	Culti- vated.	Total.
Phlæoideæ, . . . . .	1	..	1	1	..	1	..	..	..
Olyreæ, . . . . .	2	1	2	3	1	4	..	1	1
Chlorideæ, . . . . .	9	1	10	7	1	8	5	0	5
Hordêeæ, . . . . .	..	2	2	2	2	4	4	..	4
Rotbolliææ, . . . . .	7	..	7	3	..	3	1	..	1
Arundineæ, . . . . .	2	1	2	2	..	2	..	..	..
Aveneæ, . . . . .	..	..	..	1	1	2	1	0	1
Poeæ, . . . . .	15	..	15	12	..	12	9	..	9
Bambuseæ, . . . . .	1	..	1	..	2	2	..	..	..
Oryzeæ, . . . . .	1	1	2	1	1	2	..	1	1
Total Grasses, . . . . .	103	15	118	98	15	112	59	8	67
Total Endogens, . . . .	142	28	170	166	32	198	67	14	81
Grand Total. } Phanerogams, }	605	179	775	546	181	724	255	129	383

# NOTES.

No. 3.—The question of the foreign origin of the custard apple admits of but little doubt on my mind. Those who argue in favour of its being indigenous quote the native name Sítaphal, and the tradition that it was upon it that Síta supported herself during her long wanderings in the forests in Bundelkund. And they state that it is met wild in many parts of the jungle of central India.

It is certainly found in great abundance on certain hills in Bundelkund, but on no hills is it found on which there are not large forts, e. g. Marga, Kallinger and Ajigarh. I have never seen a bush of it on any other, not even those next adjoining, and from all the enquiries I have made among the natives I gather that it is not found in any other localities.

The only place which has been specifically mentioned to me as a habitat is the hill of Asirgarh, likewise crowned by a fort. I see therefore no reason to doubt that it has run wild on these hills from gardens inside the fort, the large seeds dropped by birds monkeys or bears, would readily germinate, the only matter for surprise is that it has not been more widely diffused. I do not admit the closeness of the



resemblance of the fruit described by Capt. Abbott in the XVI. Vol. J. A. S. p. 666 to the custard apple. It might as well represent a Jack fruit—but is I rather imagine a fancy composition—than an imitation of any real fruit.

53.—*HIBISCUS CUSPIDATUS*—molliter pubescens, foliis 5 lobato-cordatis, capsulæ valvis bi-alatis cuspidatis. This much resembles *H. vitifolius* but differs in the softer pubescence and the cuspidate valves of the capsules.

The flowers are large and handsome.

54.—*SERRÆA? RUPESTRIS*—suffruticosa, incano-velutina foliis ovato-oblongis argute serratis acuminatis, stipulis caducis subulatis, floribus axillaribus solitariis pedunculis articulatis, involucre 3-phylo, sepalis cuspidatis, capsula ovata 5-valvi, seminibus angulosis tuberculatis.

I hesitate to call this *Serræa* on such small data simply because it has a 3 leaved involucre and 5 valved capsule, as I have not seen the flower yet. It may form the type of a new genus.

I found it on the top of the hill at Sehonda and again at the fall of the Pysunee.

87.—I have named this plant doubtfully *Malva Borbonica*. It grows abundantly in the hedge of a garden at Banda. I have not seen it elsewhere. The habitat is that of *Sida*.

107.—I have entered under the name *Z. hortensis* the large fruited variety (?) of *Z. Jujuba*. See Roxb. H. Ind. Ed. Wall, p. 358.

144.—*INDIGOFERA ANGULOSA*—suffruticosa, pilis bifidis strigosocana, foliis 1-2 jugis cum impari foliolis ellipticis ovatisve mucronatis utrinque strigosis, subtus canis. Racemis axillaribus longissimis, multifloris legumine toruloso 1-4 spermo, articulis pene gibbis 4 angulatis, longe rostato, seminibus facibus triangularibus.

The legumes are of a very peculiar shape and difficult to describe. It is a slender erect under-shrub.

149.—*TEPHROSIA VICIÆFORMIS*—herbacea, diffusa, ramis flexuosis costato-sub-angulatis in costis adpresse puberulis, stipulis setaceis, foliis 7-8 jugis foliolis oblongis plerumque retusis longiuscule mucronatis, supra glabris subtus parce et adpresse pilosis, calyce vexillâque pubescentibus, stam. monadelphis decimo basi sub-libero, stylo apice plano levi stigmate imberbi, ovario sericeo, legumine vix compresso,



pilis deorsim adpressis parcé adperso marginato apiculato, seminibus membranâ tenerâ obtectis, oblongis eleganter marmoratis.

The inflorescence is similar to, but  $\frac{1}{4}$  the size of *T. purpurea*, having either twin axillary flowers or few flowered racemes opposite the leaves. —Grows in granite detritus.

157.—This appears to me undescribed but as I have not seen it in flower I do not attempt to name it. The stem is covered with hamose hairs—and the joints of the legumes are likewise hamosely ciliated. It is an annual erect species growing 2 or 3 feet high.

168.—The great profusion of alysicarpi in this part of the country is remarkable. There are eight species described in W. and A. Prod. of these I have six; and five new species, of which I subjoin the following characters.

To the character of *A. longifolius*,—p. 233-4 W. and A. Prod.—may be added that the young racemes are covered by the imbricated caducous bracts which are broad ovate, cuspidate and hairy. The leaves in the Banda plant never exceed 3 and seldom 2 inches in length.

**ALYSICARPUS OBOVATUS**—Erectus, ramosus, caulibus ramisque teretibus pilosis, foliis *obovatis* (2 poll. long: 1 lat.) supra glabris subtus adpresse pilosis, petiolis canaliculato-alatis ciliatis, stipellis oblique cuneatis scariosis, stipulis scariosis basi sub-coalitis longe cuspidatis (cito laceris sub-caducis petiolo longioribus,) racemis spiciformibus terminalibus bracteis late ovatis acutis glabris minute ciliatis striatis herbaceis, rachi sub-glabro, pedicellis puberulis, calyce 4 fido segmentis 3 angustioribus integris acutis margine ciliatis, inferiore carinato, carinâ ciliolatâ, lęguminis articulis 4-6, infimo sterili, gradatim majoribus obliquis irregulariter rugosis acute ancipitibus, supremo levi puberulo mucroniformi.

This species grows from 3 to 6 feet high. The flowers open about 8 A. M. and close before 3 P. M. (in *longifolia* they open about 11 and close at 2). The standard is of a ruddy flesh color with a tinge of orange, the keel and wings a bright purple. The latter are attached by their edge to a groove in the keel at right angles. This is abundant in the Khureef corn fields, especially in black soil.

**A. TETRAGONOLOBUS**—procumbens a basi ramosus, ramis teretibus lined pilosa notatis, foliis breviter petiolatis ovatis oblongisve obtusis supremis angustioribus basi sub-cordatis supra glabris subtus strigosis



stipulis basi latis sub cordatis cuneatis acutis ciliatis petiolo longioribus, racemis laxis terminalibus oppositifoliisque, bracteis late ovatis acutis striatis puberulis ciliolatis, præ anthesia caducis, bifloris, rachi pedicellisque puberulis, calyce 4 fido segmento superiori bifido, omnibus acutis puberulis longe pilis albis ciliatis in fructu approximato-imbricatis, articulum secundum superantibus; leguminibus 4-8 articulatis, inter articulos valde contractis, sub-arcuatis articulis plus minus obliquis, inæqualiter *quadrangularibus* angulis costatis, lateribus valde reticulato-rugosis puberulis, infimo stipitiformi et supremo mucronato sterilibus.

This much resembles in habit *monilifer* and *styraci-folius* and like them grows in barren grassy places but is easily distinguished by the line of hairs on the stem and the 4-angled legume. Its flowers open about noon and close at 2 or 3.

**A. GRACILIS**—erecta glabra ramosa ramis teretibus, stipulis scariosis acuminatis sub-vaginantibus petiolo longioribus, foliis unifoliatis pedicello caudiculatis stipellis minutis punctiformibus foliolo anguste elliptico basi sub-cordato apice mucronato, supra glabro, subtus pallido, parce piloso, racemis axillaribus terminalibusque, bracteis caducis 2 floris, calyce 4-fido segmentis ciliolatis, superiore breviter bidentato, vix imbricatis, legumine calyce plus duplo longiore 3-5 articulo moniliformi articulo supremo mucroniformi puberulo, ceteris obliquis valde contractis sub-compressis glabris vix reticulatis.

This differs much in habit from all the other species I know, very slender, about 2 feet high, growing on shady rocks at Gurhrampûr.

**A. RUPICOLA**—erecta, parce ramosa, ramis teretibus lineâ puberula alternanti, pubescentiâ biformi pilis adpressis rectis, vel minimis apertis hamosis, foliis oblongis basi cordatis acutis vel obtusis mucronatis supra glabris subtus puberulis, pilis in nervis et margine rectis, ceteris hamosis, stipulis acuminatis glabratis demum laceris. Racemis axillaribus terminalibusque bracteis ovatis acuminatis bifloris, calyce 4-fido lacunâ acutis sejunctis apice setaceis, posteriori 2-fido legumine 6-8 articulo infimo stipe biformi supremo mucronato, ceteris fertilibus striato reticulatis minute hamoso-puberulis, diaphragmate sæpius carente.

This species grows among granite rocks—as at Sainpûr and Kartal, its pubescence distinguishes it from the allied species.





**ALYSICARPUS HAMOSUS**—Diffusa, ramis teretibus hirsutis pilis vel longis rectis debilibus, vel brevibus rigidis hamosis, foliis uni-foliolatis stipulis lanceolatis scariosis ciliatis, stipellis minutissimis, foliolis late ovatis rotundatisve basi cordatis rotundatisve, pilosis, racemis terminalibus axillaribusque paucifloris rachi filiformi hirsuto, bracteis hirsutis caducis bifloris distantibus calyce 4-fido, laciniis hirsutis divergentibus acutis, postico bifido, legumine breviter stipitato, articulis circiter 7, supremo mucroniformi, ancipitibus nervoso reticulatis, utrinque diaphragmate ovali clausis, pilis biformibus hirsuto-lappaceis, seminibus maculatis compressis ovalibus.

This has entirely the habit of a *Desmodium*, it is in great abundance on the north face of Kallinger below the wicket. I have not seen it elsewhere. The whole plant is like several *Desmodi* very sequacious.

184-5.—From want of flowers I am unable to identify these two species of *Dalbergia*. The same remark applies to No. 221-2. *Albizzia* sp. which are allied to *A. Wightii*.

201-2.—Both these are distinct from any species described either by Roxb. or W. and A. but my specimens being very imperfect I cannot give a proper character to them, both belong to the non-twining section of *Strophostyles*. The former has filiform stems slightly hirsute, leaves shortly acuminate rhomboid, adnate stipules, subulate stipells, racemes not much elongated few-flowered, legumes smooth, sub-cylindric sutures slightly thickened and sharp pointed, seeds truncated, bracts resembling the stipules.

The other is erect, stem hirsute, leaves puberulous rhomboid or 3-lobed, racemes short peduncled few-flowered, legumes straight, subterete thickened at the sutures, almost smooth.

243.—**ANAGEISSUS PENDULUS**—frutex v. subarboreus ramulis pendulis foliis sub-oppositis breviter petiolatis, utrinque minute adpresse sericeis, obovatis lanceolatisve, obtusis acutisve, pedunculis sub-axillaribus solitariis vel geminis 1-2 capitulatis; capitulis parvis globosis pubescentibus.

Calycis limbo 5 dentato dentibus obtusis; *stam.* 10, exterioribus cum calycis dentibus alternis; filamentis longis, anthera globosa subcordata, stylo simplici stamine, brevioris basi disco dense hirsuto circumdato: nuce bialato puberulo apiculato capitulis densis pisi magnitudine.

This very elegant bush completely covers some hills (as *Patraha*) to



the exclusion of all other underwood—when of large size it may form a tree 15-20 feet high, and the leaves are obtuse and obovate, they only assume the acute elliptic form where they have been browsed on by goats. They then assume a compact appearance like an alpine shrub. It is very probable that this is the *Conocarpus myrtifolius* alluded to by Royle as found by him on the banks of the Jumna—but as no description of that has been published I have given the above name to be rejected, if they be the same, as *myrtifolius* is very appropriate.

270—LUFFA BANDAAL—I have little doubt that this is Roxburgh's species, which was sent to him from Cawnpore, and is called Bandál by the natives, but his description is imperfect and somewhat incorrect. I have never seen the plant climbing and the echini of the fruit are not ciliate while the leaves are uniformly 5-lobed, however, the leaves of all cucurbits vary so much that they are not a character at all to be relied on, should it be a different species it should be called *longistyla*. The following is the detailed description.

*Dioica diffusa*, ramis sub-glabris scabriusculis, foliis longe petiolatis 5-lobis, lobo medio longiori acuto plus minus simiato lobato, ceteris acutis vel obtusis denticulatis, utrinque scabris glabris, cirrhis bifidis pedunculis geminis axillaribus uno longissimo 1-floro, altero racemoso multifloro, bractea parva ovata, pedicellis gracilibus, calyce 5 fido rotato, corolla rotata 5 fidâ tenui alba, segmentis obtusis extus parce pilosis, staminibus 5, triadelphis ♀, pedunculis solitariis unifloris petiolo (adulto) brevioribus calyce villosa, limbi laciniis 5 acutis, corolla sub-rotata ut in ♂—stylo longo apice 3-fido stigm. 3-bifidis—peponide ovato, v. sub-globo-oso echinato echinis glabris apice stylo persistente increscente apiculato.

The fruit is bitter and is sold in the bazars as a horse medicine. It grows abundantly on marshy land at the commencement of the rains—the flowers open in the morning and close before ten. They are pure white and very delicate in texture.

298-9.—I have not seen the flower of either of these species, therefore am uncertain as to their genus. The former has dark polished brown bark and deep green polished leaves lanceolate. The latter has pale bark and small leaves not unlike *Gardenia tetrasperma*.

309.—VEMONIA (*Decaneurum*) DIVERGENS—This is in truth as well as *V. multiflora* technically a *Vemonia*; the outer series of short pistils is present but most exceedingly caducous.



308.—*V. ASPERA*.—The plant I thus name and which I have also found in the Sewaliks and on Parasnath agrees exactly with Roxburgh's description of a few large terminal capituli; they cannot be called as in D. C. "*Paniculæ subcorymbosæ*."

311.—*ADENOSTEMMA ANGUSTIFOLIA*—foliis lineari-lanceolatis utrinque acuminatis longe petiolatis serrulatis corymbysi oligo-cephalis, acheniis levibus glandulis pedicellatis coronatis.

My specimens were gathered very late in the season. I could find but a single flower and therefore cannot now give a more detailed description.

It may be a narrow-leaved and few-flowered variety of *A. leiocarpum* with which I am not acquainted.

312.—*ERIGERON ASTEROIDES*—I should have no doubt about this species had Roxb. not omitted all mention of the tubular ♀ florets. It is most probably the same as *E. sublyratum* D. C. but the involucre is glandular not sub-glabrous.

317.—*BLUMEA AMPLECTENS*—I am not sure of the identity of this, D. C. describes it "fl. masc. circiter 15-20"—in my plant there are at least 30—he also calls it sub-glabrate whereas this even in the oldest plants is villous. Further no mention is made of the peculiar character of the pappus—which is in the disk 15-bristled, in the ray 5-bristled, and the radical achenia 5-ribbed—should it be a new species I would propose the name *undulata*.

319.—*B. BOVINA (oxyodonta B. D. C.)* I refer this plant to this name with some hesitation. I know several forms which to me appear distinct species which can only be referred to *oxyodonta*. In this the mouths of the florets are ciliate; and I have in vain searched for anthers: hundreds of capituli I have examined and found none. I have observed the same in a small procumbens *oxyodonta* common at Saharunpoor.

321.—*B. FONTINALIS*—Caulibus erectis strictis pubescentibus, foliis obovatis grosse dentatis dentibus calloso mucronatis in petiolum attenuatis utrinque pubescentibus, paniculis confertifloris, ramulis 3 floris, inferioribus axillaribus folio brevioribus, superioribus thyrsoides sub-aphyllis, capitulis ovatis nutantibus, involucri squamis exterioribus lanceolatis hirsutis ciliatisque, interioribus subscariosis linearibus acutis discum superantibus, floribus radii oo; disci paucis 5-meris apice



culis obovatis spathulatisve sub-sessilibus mucronatis glaberrimis margine tantum pilis paucis adpresse strigosis floribus vel solitariis vel in cymis sub-dichotomis in apice ramulorum dispositis, calyce 5-partito segmentis anguste ovatis acuminatis quincuncilibus strigose ciliatis, corolla campanulata 5-fida, æstivatione 5 unciali glabra, staminibus 5 basi corollæ ortis, inclusis, filamentis latiusculis subiter attenuatis antheris terminalibus basi fixis sagittatis rima laterali dehiscentibus, polline elliptico, ovario biloculari glabro ovulis 4-pendulis, stylo bifido, stigmatibus capitatis. Bacca 4 sperma, succo aqueo fulvo, dissepimento evanido, seminibus 2-3 sæpe abortivis, testa dura embryon leviter curvato in medio albuminis tenuis sito, cotyledonibus planis crassiusculis obovatis.

This shrub is very peculiar in its habit growing upon granite rocks in the bed of the river often submerged for weeks, its long branches hanging down into the water when the rocks are left exposed. These branches are so flexible and tough that they may be tied in a knot without breaking.

I have entered fully into the description as there is some doubt in my mind whether this should not be referred to *Ehretia*, or whether (perhaps with *E. viminia*, Wall) with another very similar species which differs in having silky pubescence, found by Major Madden in the same sort of position on rocks in the Kali Ganga in Kemaon, which I propose calling *R. sericea*, it should not be considered as belonging to the S. American genus *Rhabdia*.

The differences between the two genera appear to consist first in the æstivation of the calyx—secondly in the shape of the corolla—thirdly in the proportionate length of the stamina and corol—fourth in the insertion of the stamina—fifth in the position of the anther on the filament—sixth the style whether bifid or simple—seventh the nature of the berry—eighth the nature of the albumen—ninth the shape of the embryo. In the 1st, 2nd, 3rd, 4th, 5th and 7th points, it is a *Rhabdia*—but in the 6th, its bifid style, in the 8th, its thin scarcely fleshy albumen, and in the 9th, the slightly curved embryo, would make it rather an *Ehretia*. I think the preponderance of characters, added to the habit give the verdict in favour of *Rhabdia*.

470.—*EBERMAIERA PEDICELLATA*—Glabriuscula partibus junioribus lanato-puberulis, foliis ovatis oblongisve in petiolum atte-





nuatis obtusis integris fl. ternis axillaribus pedicellatis, bracteis anguste ovatis basi attenuatis calycisque lacineis glanduloso—ciliatis, corollæ fauce filamentisque pilis parvis rubris instructis, antherarum loculis mucronatis, minorum discretis. Found in the inside of the ancient fort of Hansi.

510.—*SALVIA PUMILA*—There is little doubt of the identity of this, as I have since found it in its Jacquemontian habitat in the Punjab: my specimens differ however, in having the lower cell of the anther polliniferous, the upper stamen though very minute, is present and club-shaped. It is very strange, how this plant, a native of the Salt and Soliman ranges, naturally growing among dry rocks, should have been found on the sands of the Jumna. The leaves are of a cinereous grey not green colour as described.

512.—*SALVIA FONTINALIS*—Erecta, ramosa, caule quadrangulâri ramisque adscendentibus (nec brachiatis) deorsum pubescentibus, foliis lanceolatis in petiolo (radicalibus longissime) attenuatis crenato-dentatis utrinque pilosis vix rugosis verticellis 6 floris pedicellis folio florali deflexo longioribus, calyce glanduloso pubescenti, labio superiore brevissime 3 dentato dente medio brevior\* inferioris dentibus acutis, corolla calycem vix superante labii inferioris lobo medio rotundato maculato, staminibus superioribus abortivis minutis inferioris connectivo postice sursum producta loculum cassum ferente.

Spring-heads by the Cane. Perhaps this is but a variety of *plebeia*. Roxb. I. p. 146, mentions the upper sterile stamens,—the shape of the leaves, more bushy habit and 3-toothed upper lip of calyx are the distinguishing marks.

543.—My specimens are too imperfect to admit of proper description.

555.—I do not attempt to describe the Euphorbiaceæ that appear to me now, in the absence of any later work than Roxburgh.

575.—The leaves of the seedling *Almus integrifolia* are coarse, serrate and scabrous.

644.—*COMMELINA GELATINOSA*—caulibus ramosis semi-teretibus uno latere plano scabro pubescente foliis oblongo—lanceolatis acuminatis sub-inæqualibus subtus glaucis minute puberulis supra scabris breviter petiolatis vaginis striatis margine fissis ciliatis fauce barbatis,

\* In the dried specimen, the divisions adhere, so as to make it appear entire.



*haud incrassatis*, antheris tenuiter et distincte subcaudatis, pappo albo scabrello pauciseto. Fructum maturum non vidi.

I found this at the spring-heads on the banks of the Cane (Ken) but it dried up before coming to perfection. It may be considered a variety of *B. lacera*, but differs much in appearance, the leaves being of a dark gloomy green and the stems and involucre pur-purescent.

323.—*PULICARIA FOLIOLOSA*.—My plant, which is not uncommon on the banks of Ken, differs from description in D. C. V. p. 480 in being of a bright light green and not cinereous—and to the description might be added “*achenis villosis apice glanduloso teritibus.*”

324.—*PULICARIA SAXICOLA* decumbens, ramis divaricatis incanisque, demum glabris foliosis apice 1-cephalis, foliis omnibus sepilibus angustis oblongis ramo sub-adpressis integris vel remote denticulatis obtusis apice callosomucronulatis utrinque plus minus sericeo-pubescentibus involucri squamis exterioribus arachnoideo-lanosis oblongis *latiusculis* apice subiter attenuato liberis, junioribus foliaceis demum sphacelatis infimis infra glabriusculis, sursum pilosis subiter cuspidatis, fl. radii ligulâ 3 nerveâ, styli ramis longis apice acumine appendiculatis fl. disci 5-meris margine incrassatis, antherarum caudis *latiusculis* basi sub-laceris, styli ramis brevibus lanceolatis post anthesin caducis, pappo exteriori coroniformi lacero vel ciliato-dentato, inferiore 10-setoso setis apice barbellatis sub-plumosis, achenio sub-tereti compressiusculo lineis 5 pilosis instructo, receptaculo alveolato parvè piloso.

Grows on the rocks or gravelly debris of the granite hills; as at Sehonda, Kartal. The solitary long peduncled heads, sessile not stem-clasping leaves, and the pappus distinguish it readily from all the species in D. C.

384.—*GYMNEMA MELICIDA*. The only decided character by which I can distinguish this from *G. sylvestris* is that the squamulæ of the corolla are *acute* and *cover the gynostegium*, not obtuse and shorter as described by DuRoi. The leaves are more lanceolate and more sharply pointed than in the specimens of *sylvestris* that I have.

I have given the name from the peculiar quality of the leaves. A leaf chewed in the mouth deprives it of all power of tasting any thing sweet for many hours afterwards.

397.—I should have named this *E. sulcatum*, but that the pores of



the anthers are not confluent, I therefore am in doubt regarding it. Should it not be *sulcatum*, I would call it—

*EXACUM RIVULARE*, caulibus vel pluribus erectis *acute* 4-gonis plus minus ramosis, foliis radiculibus petiolatis caulinis sepilibus oppositis oblongo-lanceolatis acutis trinervis, calycis 4-partiti alati segmentis acutis, corollæ purpureæ segmentis late obovatis tubo prope duplo longioribus, pedicellis foliis longioribus.

441.—*TRICHODESMA HIRSUTA*—Erecta, ramosa, hirsuta, ramis 4-angularibus sulcatis, foliis caulinis oppositis sepilibus ovato lanceolatis scabro-hirsutis floralibus oblongis alternis sub-amplexi-caulibus pedicellis nutantibus calycibusque hirsutis sepalis basi longe sagittatis acuminatissimis in fructu apertis (nec clausis ut in *indica*) corollæ cæruleæ segmentis rotundatis apice subiter in caudulam productis nuculis levibus.

This differs from *T. indica* in habit and pubescence and in the shape of the leaves—the horns of the calyx are much longer than even in *T. spinulosa*.

443.—*TRICHODESMA INÆQUALE*—Erectum ramosum totum strigis patulis hispidum, foliis inferioribus sepilibus oppositis late ovatis obtusis superioribus sub-amplexicaulibus cordatis, floralibus alternis late amplexicaulibus acutiusculis pedicellis oppositifoliis 1 floris, calycis (quasi pentapteri) segmentis basi acuto auriculatis, margine et nervo medio hispidis, corollæ limbo paullo brevioribus corollæ *inæqualis* tubo oblique contracto, intus glabro, limbo sub-bilabiato intus piloso, labio superiore 3-lobo, ad faucem foveolis 2 notatis, inferiore bilobo lobis latioribus omnibus obtusis mucronatis, æstivatione quincunciali, antheris in tubum corollæ sessilibus (filamento adnato basi libero) dorso pilosis apice in cuspidem nigriscente rectum acutum productis pilis longis albis erectis dorso vestitis,—squamis 5 ciliatis emarginatis ad bases staminum usque oppositis, stylo ad medium antherarum attingente apice truncato excavato, stigmate in medio prominculo ovario glabro, nuculis dorso levibus ventre rugosis.

I have great doubts whether this is *J. amplexicaule* or not, caused by the omission in D. C. (p. 162, Vol. X.) of all mention of the irregularity of the corolla.

434.—*RHABDIA FLUVIALIS*—Suffrutex glaberrimus, ramis virgatis teretibus foliis sub-alternis v. irregulariter dispositis crebris crassius-



culis obovatis spathulatisve sub-sessilibus mucronatis glaberrimis margine tantum pilis paucis adpresse strigosis floribus vel solitariis vel in cymis sub-dichotomis in apice ramulorum dispositis, calyce 5-partito segmentis anguste ovatis acuminatis quincuncilibus strigose ciliatis, corolla campanulata 5-fida, æstivatione 5 unciali glabra, staminibus 5 basi corollæ ortis, inclusis, filamentis latiusculis subiter attenuatis antheris terminalibus basi fixis sagittatis rima laterali dehiscentibus, polline elliptico, ovario biloculari glabro ovulis 4-pendulis, stylo bifido, stigmatibus capitatis. Bacca 4 sperma, succo aqueo fulvo, dissepimento evanido, seminibus 2-3 sæpe abortivis, testa dura embryon leviter curvato in medio albuminis tenuis sito, cotyledonibus planis crassiusculis obovatis.

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spathis falcatis acutis turbinato-cumellatis uni-rarius bi-pedicelliferis, ambobus floriferis capsulâ 3-loculari 3 sperma striatâ.

Rocks at Banda.—

Caules ramosi geniculati diffusi sub-ascendentes vaginæ breves striatæ scabriusculæ margine ciliatæ ore barbatae, folia oblongo-linearia 4-5 pollicaria. Spathæ terminales sub-corymbosæ pedunculatæ bracteis hyalinis ovatis pedunculum intra vaginam amplexantibus, falcatae acutæ turbinato-cucullatæ striatæ parce pilosæ succo gelatinoso plenæ. Pedicelli singuli inclusi ramis gemini (altero exserto) 3-4 flori quorum plerumque unum tantum fructifer; sepala 3 hyalina, superum ovatum acutum erectum, 2 concava, obtuso deflexa prope apicem in unum coalita, cyathum emarginatum formantia. Petala 2 longe unguiculata limbo orbiculato pallide cærulea, tertium minimum hyalinum ellipticum acutum, stamina 3, duorum antheris ovatis cæruleis, tertii flavâ (valvis nigrescentibus) late sagittatâ basi deformatâ dorso glandulosa. Parænteræ cruciatæ glanduliferæ. Stylus in alabastro circinnatim, defloratione spiraliter tortus. Capsula 3 lori, 3 spermis tenuiter striata in spatha nidulans semina majuscula nigra non lucida.

This comes nearest to *C. Donii*, *striata* and *angustifolia*, but is immediately distinguishable from them by the scabrous upper surface of the leaves, as well as other points. The spathes are generally filled with a clear gelatinous substance.

665.—*PASPALUM BIFARIUM*—culmis decumbentibus glabris vaginis acute carinatis internodiis multo longioribus, foliis plerumque approximatis bifaris lin-lanceolatis acutis glaberrimis glaucescentibus anguste marginatis apicem versus tantum semilatis, ligulâ membranaceâ in margine vaginæ decurrente, culmis floriferis terminalibus lateralibusve paulo elongatis, racemis conjugatis secundis divergentibus, rachi planâ herbaceo-marginatâ locustis ternis pedicellis inæqualibus decorum fl. superiorum plus minus rachi adnatis apice tumidis (locustâ cadente) cupuliformibus glabris lævibusque, glumis 2 pubescentibus inæqualibus vix florum excedentibus vertices, Paleis in fructu induratis lucidis ovatis.

Found in ground that had been overflowed under trees at Rewai, a low grass, but as other species commonly larger were growing near it in a reduced form it may sometimes grow larger. As far as the description Kunth, p. 48 of *P. brevifolium* Hugg goes it answers this



but it is so short that one cannot be certain from it. It may be Roxb.'s *Milium filiforme*, p. 314, Vol. I. but I do not think it can be.

669.—*PANICUM CONCINNUM*—Repens culmis teretibus glabris, nodis pilosis (inferioribus radicanlibus), vaginis inferioribus pilosis superioribus glabris margine tantum ciliatis arcte culmum involventibus, fauce ciliato, ligula ciliata lamina plana quasi petiolata basi pilis longis barbata ceterum glabra, scaberrimâ margine serrulata (3-4 lin. lata, 2-4 poll longa). Paniculis sub-decompositis secundis, ramis secundis racemosis vel solitariis sessilibus vel 1, 2 pedicellatis adjunctis, rachi scabro-angulosa, rachilla scabro pubescente, locustis solitariis omnibus breviter pedicellatis ad apicem pedicelli articulatis, bifloris, glumis 2 exteriore minima ovata apice membranaceâ, interiore (inferiore) ovata acuta 3-5 nervea extus pilosa.

fl. ♂ vel ♂ 2-paleato, palea exteriore glumâ secunda paulo longiore 3 nervea ciliata apice et margine hyalina acutiuscula, interiore hyalino oblongâ 2-nerveâ fl. ♂ paleis lucidis obtusis lævissimis, stam. 3, anth. e flavis fuscis, lodiculis 2 oblique obcuneatis eroso truncatis.

This delicate and elegant species is an annual in cultivated fields, rather light soil; it is readily distinguished from all the other species I have seen in its pubescent racemose inflorescence, found at Mowai near Banda.

676.—*PANICUM TRIFLORUM*—Annuum, repens, molliter pubescens. Culmis decumbentibus semi-teretibus pubescentibus, vaginis laxis, ligula breviciliatâ, foliis oblongo-linearibus basi sub-cordatis apice breviter acuminatis quandoque latiusculis, panicula pauce-ramosis, tomentosa, racemis rectis sub-alternis divergentibus, rachi et rachilla excavatis dorso tomentosa angulis scabris pedicellis pilosis setis paucis fulcratis locustis B. 2, vel 1, uno subsessili late ovatis acutis, trifloris (rarius 2); glumis 2 exteriore sub-decurrente sub-hyalina obscure 3-nervea ceteras basi arcte amplexetenti, interiore late ovata 5 perviâ floribus 3 (v. 2,) quorum 2 (v. 1,) neutris. 1 ♂, flore inter neutros, fl. neutro inferiore 1-rarius 2-paleato palea exteriore 5 nervea acutâ, interiore hyalinâ alterius floris neutri palea exteriore duriore concavo 5 nervea apiculata, interiore tryalinâ oblongâ margine involute bidentato, floris fertili paleâ rugosis, exteriore concava 3-nervea nervis prominentibus glabris, acutiuscula interiore isto incluso, marginibus involutis sub-auriculatis, lodiculis majusculis, dolabrifformibus crenu-



latis, Stam. 3, antheris vix exsertis fuscis, stylis 2 a basi divergentibus, stigmatibus ramoso-plumosis, semine hinc compresso.

Among rocks at Banda; I formerly found it at Rudour in fields, in the Sikh states—the number of florets at once distinguishes it from the whole genus.

672.—This species resemble *Vestitum* and my *Triflorum*, my specimens are unfortunately imperfect.

673-4.—These are both common species and one of them is probably *P. umbrosum*, Roxb.—but without authentic specimens of his plant I cannot determine which—in fact the same remark applies to some others that I have named in the list. I have not referred any to the genera *Oplismenus* and *Eriochloa*, the limits of which as distinguished from *Panicum* are not I think satisfactorily laid down yet, while *Digitaria* I consider an indisputably natural genus.

697.—*PENNISETUM HOLCOIDE*—This answers very completely to the description in Roxb. of *Pan. holcoide*, p. 285 excepting that he says the flowers grow without order; whereas in my plant they are regularly arranged on the alternate joints of the waved rachis so as to make a four-sided spike.

698.—*P. ARANEOSUM*—Erectum culmis basi geniculatis radican-  
bus nodisque glabris, vaginis inferioribus pubescentibus superioribus  
glabris, ligula ciliato-membranaceâ, foliis latiusculis planis glabris  
prope basim pilis perpaucis longis sparsis barbellatis, subtus lævibus  
supra scabris margine semilatis; spicis terminalibus involucris multi-  
setosis duplici serie setis exterioribus minoribus, interioribus valde  
inæqualibus prope medium pilis longis araneosis coalitis apice nudis  
hispidis, uno ceteris duplo longiore (8-9 lin) bi-locustato, locusta una  
sessili biflora, alterâ pedicellato prius florente uniflorâ; floris sessilis  
gluma exteriori flore duplo breviori hyalina longissimo araneoso-ciliatâ,  
altera flore superante hyalina 3-5 nervi apice breviter mucronatâ, flore  
inferiore neutro vel ♂ 1-2 paleata, p. exteriori truncata hyalina  
apice ciliolatâ glumam æmulante sub 3-nervi glanduloso-punctata,  
p. altera oblonga hyalina apice ciliatâ plerumque carente, lodiculis  
nullis, Flor. ♂ p. lucidis inclusis sub-acutis, apice ciliolatis Stam. 3,  
antheris flavis apice mucronulatis, lodiculis oblique lanceolatis acutis,  
ovario ovato, stylis basi breviter coalitis ramis longis exsertis apice  
plumosis.





Grows among the granite rocks on the hills about Banda. Differs from *P. triflora* in having but 1 or 2 flowers, the form &c. arachneosity of the involucre and the mucronulate paleæ of the ♂.

699.—*P. IMBERBE*—Erecta ramosa, culmis nodisque glaberrimis vaginis glabris, ligula brevi lacero-ciliata, folia sub-petiolatis pilis paucis barbatis latiusculis acuminatissimis utrinque glabris supra scabris subtus lævibus margine serrulatis, spicis terminalibus axillaribusque cylindricis laxis rachi compressa utrinque (pedicellis adnatis?) alato involucris sessilibus setis basi connexis sub-simplice serie inæqualibus unâ ceteris plus duplo longiore locustâ solitariâ 1 flora, glumis 2 intense rubro-purpureis glabris exteriore longiore acuta interiore 3 dentata, marginibus involutis hyalinis (an potius gluma exteriore carente, et hac paleâ neutra? floris secundi?) paleis pallidis acutis apice ciliatis demum induratis semen amplexantibus, stam. 3 antheris flavis locellis parallelis muticis glabris, stylis longis dense barbellatis pallidis.

Grows among bushes 3-8 feet high, leaves 6-18 inches long, 4-16 lines broad—habit much as the two preceding found at Gurhrâmpûr, November.

711.—*SORGHUM GIGANTEUM*—This is I apprehend rather a variety of *S. Halepense* than a distinct species. It differs principally in size, the great breadth of the leaves (1 inch) and having 2-pedicelle ♂ flowers to the sessile ♀.

706.—*POGONATHERUM TENUE*—culmis filiformibus ramosis vaginis glabris, ligulâ membranaceâ ciliatâ folio cordato-ovato acuminata (1 poll long.) pedunculis elongatis gracilibus spicis conjugatis, rachi articulatâ pilis albis inæqualibus longi ciliatis, articulis 1-floris, locustis solitareis. Gluma exteriore binervi bi-mucronatâ nervis hispidulis g. superiore ovatâ in setam ipsâ longiore productâ palea inferiore profunde bi-partitâ laciniis acutis hyalinis cum aristâ longa tortili e fissura ortâ, p. superiore hyalina, lodiculis o, stigmatibus plumosis.

This is a small delicate grass growing among rocks at Gurhrâmpûr, quite distinct from either of the Himalayan species of which I have specimens, it resembles in habit *Leptatherum molle*. The ciliate rachis at once distinguishes it from *Andropogon filiforme*, Roxb. which appears to belong likewise to this genus, though the character as given in Endlicher should be slightly altered to admit them.



715.—*ANDROPOGON ECHINATUM*—Culmis tenuibus ramosis geniculatis glabris nodis pubescentibus vaginis brevibus ore barbatis, ligulâ ciliata lacerâ foliis lanceolatis acutis utrinque molliter pubescentibus pilis basi tumidis ciliatis nec serrulatis, spicis conjugatis secundis pedunculis longis pubescentibus, spiculis geminis alternantibus una in rachi erosâ pubescenti sessili altera pedicellata locusta sessilis gluma exteriore coriaceâ ovato-lanceolata acutâ margine inflexâ exteriore pectinato-serrata, dorso nervis 3-5 echinatis, gl. interiore tenuiore sub-hyalina 3 nervi, carinâ ciliata bifida lobis acutis, floris ♂ paleis 2, exteriore oblonga obtusa hyalina, p. interiore in aristâm geniculatam tortilem producto nec basi hyalino nec ciliatâ, lodiculis obcuneato-truncatis tenuibus, stam. 3 anth. fulvis, stigmatibus elongatis fulvis.

Fl. neutri, p. tris longioribus, 2-vel una carente in glumâ superiore inclusis, acutis.

Locustæ alterius pedicello compresso ciliato gl. inferiore acutâ 5-nervi, nervis adpresse ciliatis nec echinatis, gl. sup. tenuiore 3-nervi marginibus involutis fl. ♂ pal. sup. acutiuscula, inf. acuminata, stam. 3.

Grows among rocks—Jharal—Budhgarh, &c.

This approaches very near *And. lanceolatus*—but is easily distinguished by the echinate back. It will probably form another species of *Bathratherum*, but the generic character as given in Endlicher (sup. p. 1354) must be altered to admit it.

722.—I am not satisfied which—this or No. 721,—is the true *A. Ischæmes* of Roxb.

727.—This is the most valuable grass in Bundelkund, I am unable to refer it to any of Roxb. species—and unfortunately have by some oversight omitted to preserve specimens of it.

727.—*ANTHISTIVIA CIMICINA*—Culmis erectis glabris nodis annulo piloso cinctis vaginis acute carinatis carinâ papillosa, ligula pilosa foliis longiusculis acuminatis glabris scabris margine basim versus integris vel papillosis apicem versus serrulatis, foliis floralibus gradatim minoribus magisque papillosis vaginis margine longe ciliatis, paniculis ramosis foliaceis, plus minus nutantibus, pedunculis axillaribus squamis hyalinis circumdatis, racemosis papillosis, involucri acuto cymbiformi margine membranacea carinâ papillosâ.

Locustis 7-quorum 4 verticellatis ♂ pedicellatis involucrentibus





uno centrali ♀ pedicellato intra duos ♂ pedicellato, l. 4 ext. pedicellis pilis albis circumdatis, glumis 2, acutis ellipticis, exteriore 5-7 nervi, nervis plus minus papillois glabris vel exterioribus ciliatis, interiore 3-nervi glabra. Paleis 2 linearibus hyalinis apice laceris, stam. 3-antheris luteis, lodiculis parvis oblique obcuneatis erosis.

Loc. ♀ centralis pedicello pauce piloso, gluma exteriore ovata acuminato apice bidentata, basi glabra ceterum puberula interi. glabra sub 3-nervi acuta, margine inflexo, palea hac lineari in aristam longam tortam geniculatam hispidam producta, p. altera hyalina truncata ovarium amplexante lodiculis minutis, ovario ovato in stylis angustato, stigmatibus dense plumosis; locustis 2 ♂ ut supra sed glabris.

This comes next to *A. Wightii* from which it differs in more erect habit, ciliate involucres and awned flowers and minute lodicles which are large in *Wightii*. It is moreover generally of a reddish hue. *Wightii* and *prostrata* are bright and pale green: like them this has, but in a still stronger degree, a most offensive smell exactly like that of a bed-bug whence the specific name I have given it. It grows on the margins of ponds and overflowed pasture land.

734.—This I have referred with a doubt to *funicularis*, the leaves of my plant are beset with long scattered hairs, not smooth as described, and Ruprecht does not allude to the arista being 3-cornered which appears a peculiar character. The inner glume is pale purple.

739.—I have 3 species certainly distinct all of which answer the descriptions of *Coix lachryma* as far as they go—and I am unable to say which is the true one.

741.—*CHLORIS ROXBURGHII*.—This is well described by Roxb. under the name *Melica digitata*, it is very distinct with very long linear spikes which hang loosely down.

748.—*SCHÆNFELDIA PALLIDA*.—Annua, ramosa, glabra, vaginis margine ciliolatis ligula ciliato-membranacea, foliis linearibus hinc illinc pilis perpaucis sparsis demum convolutis, spicis geminis (raro solitariis ternisve) secundis confertifloris ( $2\frac{1}{2}$  3 uncialibus) rachis margine serrulato, locustis 1 floris sessilibus bifariis, glumis 2 persistentibus acute carinatis nervo medio sulcatis, apice in setulam productis, in priore majore paleis plus duplo longiore, flore in callo sericeo stipitato bipaleaceo, p. exteriore majore alteram plana enervem involvente. Extus puberula sub apicem fissum aristam longissimum hispidum



gerente lodiculis glabris carnosus apice emarginatis, stam. 3, anth. flavis, ovario fusiformi, stylis basi approximatis, apice plumoso paullo exsertis, semine longo sub-fusiformi magno cæruleo.

The only described species of this genus is a native of Senegal; having seen only the Gen. Char. in Endlicher, I know not how far this may differ specifically. It may be the same. This plant grows pretty abundantly on barren kunkury ground—old roads, &c.—at Banda it has a very peculiar light straw colour.

749.—Not knowing what the new specific name of this grass may be, I have inserted the old one which no longer applies to it—it is the *Pommeruelle monæca* of Roxb. and is frequently referred to under that name in Griffith's Journals.

750. This is Roxburgh's *Eleusine calycina*, referred by Kunth to *leptochloe*—from which however the subulato-setaceous glumes would repel it to some new genus.

761.—This is the *Agrostis maxima* of Roxb. now *Thysanolaena*, but I know not the specific name given. It is quite different from the *Thysanolaena* abundant in the lower Himala.

765, &c.—Of the Poas and *Eragrostis* I have several new species but not being able to satisfy myself which are Roxburgh's without authentic specimens of his, I refrain from describing any.

I add a numerical abstract of the Flora according to families, distinguishing such as are wild and such as are only under cultivation. It is interesting to compare this with the similar abstract for the floras of the Sikh States and of Mooltan, showing the gradual decrease of truly tropical families and the appearance of others of more temperate regions. The extreme poverty of the Mallic flora is thus shown very conspicuously. I hope soon to be able to communicate a detailed list of the Mooltan flora as far as two years' experience of it goes;—for the difference is even greater than what would appear by this numerical abstract. Notes on local floras are of great importance in working out the geographical botany of India.

Mooltan, October 7th, 1851.



*Literary Intelligence.*

Rájá Rádhákánta Deb has just completed the 7th and last volume of the Sabdakalpadruma. The unintermittent labors of more than a quarter of a century have at last come to a successful close. The author has already achieved his reputation, as well among the Pandits of Hindustan, as the Savants of Europe. His Sanskrit Encyclopædia stands foremost among the contributions which the present or any preceding century has rendered to Sanscrit learning. The utility of such a voluminous compendium of the arts and sciences has been fully appreciated, and its author has received more than a solitary mark of acknowledgment from the Oriental scholars of the day. It would be curious to inspect the numberless testimonies of approbation which Native and Mahráttá, English and German, have competed with each other in offering to his merits ; nor is the labour undeserving of even a higher tribute. The Rájá has spent the brightest part of his mortal existence in the hope of living an immortal life for generations to come, and reared an imperishable monument for himself. He himself alludes to his labours in the Preface appended to the present volume of his work :

পঞ্চদশাবধিবর্জমানকালপর্যন্ত বহুতরপরিশ্রমে:

“From my days of scholarship up to the present time having undergone an immensity of labour, &c.,”—a period of time embracing no less than 35 years. This is more than what Furdousi, the great chronicler of the Kings of Persia, has alleged.

بسی سال بردم بشر نام رنج

“Thirty years have I laboured after the Sháh Náme.”

The words which immediately follow those already quoted from the Preface are worthy of notice : ধীরবরনিকরসাহায়ে: “with the assistance of a variety of the most learned individuals.” This is what the Pándits devoted for years to this Herculean task had every right to expect at his hands. It might be supposed that one who is so sanguine in his expectancy of obtaining his due at the hands of posterity should not be forgetful of the reputation of his coadjutors. It is alike honorable to himself, and nothing but just to his learned assistants,—for we must be permitted to observe that in Sanscrit learning the Pandits in question



are no whit inferior to the Rájá. Every body knows that so vast and voluminous a thing could never have come forth from the hands of a single mortal. Forty Frenchmen assisted in the completion of the Dictionary of the Royal Academy. It is a pity the names of Táráchánd Tarkabhusana, Is'vara Chandra Tarkasiddhánta, Rámacumára Siromani, and Sarbánanda Nyábágishya, the present, and of Sivanath Bhattacharjya and Hariprasád Tarkapunchanun the past co-adjutors of the Rájá have not been recorded in a corner of his Preface, but we think this is purely accidental,—for the Rájá would not willingly grudge them so necessary a consideration. We allude to the fact particularly inasmuch as remunerated labor however immeasurably superior to the remuneration itself, commands not the esteem and gratitude of the natives of this land. But this so far from being a correct principle of judgment that the most remarkable achievements of the world would in that case be completely bereft of their engrossing merit.

In a cursory notice of this nature, it is impossible critically to consider the variedly important contents of this Lexicon. It can be however generally stated that our Encyclopædist is always in his element on Purápic, Tantric and on all subjects connected with the modern literature of the Bráhmans, to which he has done ample justice. The work is not very full in the technicalities of the medical science, of the different systems of philosophy and of the Vedas ; but we hope the Rájá will supply these deficiencies in the supplement he promises ; and in that expectation, strongly recommend to his notice Yaska's Nirukta, every page of which will supply him with new matter ; the first page of the Nighantu contains at least a hundred words not to be met with in his Lexicon.

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The Sanskrita Press of Calcutta which we have had to notice more than once, has lately published a volume of selections from the Panchatantra and a Grammar of the Sanskrit language in Bengali, for the use of the Government Sanskrit College. Both the works are very well got up, and, we are satisfied, will prove highly useful. The Grammar is intended to do away with the old Pandit-system of teaching the language of the gods. It has no veneration for the mystic Sútras of Pánini and Vopadeva, and supplies their place with a series of simple and explicit rules in Bengali, with the aid of which one may learn the



classic language of India within a very reasonable time. The work is an elementary one, but the learned author, Pandita Isvarachandra Vidyásagara, promises a more comprehensive work on the subject, which we shall hail with much pleasure.

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A new edition of the *works* of Bháratachandra has issued from the *Purnachandrodaya* Press. It is, like most works published under native editorship, very imperfect. It has no preface, is full of errors, and abounds in doubtful readings, not to be met with in the most authentic editions of the work. In one place an entire poem, the celebrated Chorapanchásat, is introduced as the composition of Bháratachandra. We are not aware if the bard of Nadiä himself ever claimed the authorship of this exquisite poem, but certain it is that none of his editors, and among them were the late excellent poet and scholar Rádhámohana Sena, and Pandita Madanamohana Tarkalankára, has thought fit to attribute to him the credit of a composition, which is well known throughout India as the writing of Chora.

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Rev. J. Long has published a sheet containing some English words similar to Bengali in sound and sense, and illustrative of the etymological affinity which exists between the English and Bengali languages. The specimens are in most instances very apposite, and we hope the learned author will continue his researches and some day favour the literary public with further contributions on this much neglected but interesting subject, on the philosophical principles of Bopp and Pott.





PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.

FOR FEBRUARY, 1852.

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The monthly meeting of the Asiatic Society was held on Wednesday, the 4th February, 1852.

Sir James Colville, President, in the Chair.

The Minutes of the last meeting were read and confirmed.

The following presents received since the December meeting were laid on the table :—

1st. From Dr. MacGowan, Ningpo. Two specimens of Auricula shells. In reference to these, Dr. MacGowan writes :—

“The Museum of the Asiatic Society of Bengal contains, I believe, no specimen of the artificial pearls of China, as formed in a species of the *Mytilus*, I have therefore procured a couple, of which I beg the Society's acceptance. One of the specimens contains images of Buddha, and such are often employed to foster superstition.

“The method of forming them, is, placing in the living animal small metallic images, which occasion irritation ; and in the course of a year they are found covered by the pearly secretion. When the foreign body is suffered to remain for several years, and the muscle continues to thrive, very beautiful pearly deposits are formed. The accompanying specimen shows only a year's growth.

“Though the method has been long known to the Chinese, it is altogether probable that the discovery of Linnæus was wholly independent of any knowledge derived from this quarter of the world ; otherwise he would not have accepted the reward and honour bestowed on him by our country, in consequence of the invention, which at the time promised to be one of great value.”





2nd. From Dr. Buist, a volume of very beautiful drawings of Northern Antiquities. Murray's Wind and Current Charts. And, Observations on Commander Montriou's Remarks.

3rd. From the Under-Secretary to the Government of Bengal. A Map of the Seebpore district in Upper Assam. The Journal of the Indian Archipelago for October; (two copies,) and Selections from the Records of the Bengal Government, No. 4.

4th. From N. Shaw, Esq., Secretary of the Geographical Society of London. The President's Annual Address to the Society.

5th. From the British Association for the Advancement of Sciences. Report of the Association, for 1850.

6th. From the Royal Geological Society of London. Quarterly Journal of the Society for May 1851.

7th. From the Royal Geographical Society of London. Journal of the Society, vol. II, Part II., and Captain Smith's Address to the Geographical Society of London.

8th. From the Société Asiatique of Paris. Journal Asiatique, No. 81.

9th. From the Government of India. The Trial of Jotee Persaud.

10th. From the Royal Society of Northern Antiquaries. Guide to Northern Archæology, by the Earl of Ellesmere.

11th. From the German Oriental Society. Zeitschrift der Deutschen Morganländischen Gessellschaft. Vol. 5th, Parts 1, 2.

12th. From the Royal Academy of Sciences of Turin. No. 51 of the Bulletin of the Academy.

13th. From the Royal Society of London. The Philosophical Transactions for 1851, Part 1st.

14th. From the Royal Bavarian Academy of Sciences. The Transactions of the Academy, Vol. VI., part 1st.

15th. From Dr. Albrecht Weber. The White Yajur Veda, Nos. 4, 5.

16th. From Dr. N. Wallich. An Extract from the Journal of the Entomological Society of London.

17th. From T. Maclure, Esq., Contributions to Meteorology and Geology.

18th. From the Royal Asiatic Society of Madras. Journal of the Society from July to December.





19th. From J. R. Logan, Esq., *Journal of the Indian Archipelago*, for November.

20th. From its Editor, the *Oriental Christian Spectator*, for December.

21st. From its Editor, the *Oriental Baptist*, for January, 1852.

22nd. From its Editor, the *Calcutta Christian Advocate*, for January, 1852:

23rd. From the Tattvabodhini Sabhá. The *Tattvabodhini Patriká*, No. 99.

24th. From the Curators of the Academy of Leyden. *Catalogus Bibliothecæ Lugdino—Batavorum*.

25th. From Rev. A. W. Wallis. The *Benares Magazine* from its commencement to the last number published.

26th. From the Rev. J. Long. The *Satyárnab* for December 1851, *Purushottama Chandriká*, *Apurva Upakhyáná* and *Kámákhyá Tantra*.

L. Clint, Esq., duly proposed and seconded at the last meeting, was balloted for, and elected an ordinary member.

Bábu Gyánendra Mohan Tagore was proposed an ordinary member of the Society by Mr. J. R. Colvin, and seconded by the President.

The draft of a letter to the Government of Bengal, with reference to the Museum of Economic Geology, in accordance with the resolution adopted at the last meeting, was read and approved of.

Letters of thanks were received from the Royal Geographical Society of London, for the Society's Journal, Nos. 291, 212, 213; from the Royal Institution, Albemarle Street, for the Journal, No. 218 and No. 7, 1850; and from the Bavarian Academy, for the *Bibliotheca Indica*, vol. 1st. Nos. 16, 17, 18, 27, 15, 23, 25, 19, 21, 22, 26, 28, 29, 30, and 31.

Letters were received from Captain Broome, Bábu Harimohan Sen, and Hon'ble I. Erskine, intimating their wish to withdraw from the Society.

Communications were read—

1st.—From Dr. Buist, on the Forfarshire and other Northern Antiquities.

2nd.—From Major Abbott, "on the Sites of Niakara and Bucephala, with two maps and an appendix on Taxila."





3rd.—From Captain Tickell, B. N. I., on the Heuma or “Shendoos,” a tribe inhabiting the hills of Arracan.

From Captain Layard. A note of the progress made by him in his researches into the Antiquities of Gour. The following is an extract from his note.

“My few days’ residence there have been very successful in finding relics and inscriptions. Impressions of the latter I have transferred to cloth, but as yet have not had time to examine them, however I much fear, they are nothing more than *sutturs* from the *koran*. In a few days I intend searching in Rajah Adisur’s Palace, where casually I have found one or two very curious and ancient Hindu Sculptures. Diggings would, I am sure, bring many curious carvings and remains to light, but the expense is a drawback. \* \* \*

\* \* \* \* \*

\* \* \* \* \* There is a very ancient bastion and ghat called Pattal Chand, with many sculptured stones (apparently) lying in the clear water of a jheel, which is deep, I have little doubt but they would prove interesting, as they are, from traditions of the natives, remains of a Hindu Mutt and Ghat of great antiquity.”

Mr. J. R. Colvin drew the attention of the Society to the Græco-Bactrian antiquities which have lately been discovered in various parts of the Punjab, and Sir James Colville mentioned that Mr. E. Bayley, C. S., was in possession of a very interesting collection of such antiquities, and had promised to write a memoir thereon.—The Secretary was requested to address a letter to Mr. Bayley on the subject.

Mr. Piddington exhibited a beautiful medal made of silver extracted from the Deoghur copper ores, and submitted an interesting paper on the subject for publication in the Journal.

Reports having been received from the Curator of the Musuem of Economic Geology and the Librarian, the meeting adjourned.

*Confirmed 3rd March, 1852. (Signed) J. R. COLVIN, Chairman.*

#### LIBRARY.

The following additions have been made to the Library since December last.



*Presented.*

Benares Magazine, Vols. 1 to 4.—BY THE EDITOR.

Proceedings of the Anniversary Meeting of the Royal Society of Northern Antiquities, for 1851.—BY THE SOCIETY.

Journal of the Indian Archipelago—for Oct. and Nov. 1851.—BY THE EDITOR.

Ditto, 2 copies.—BY THE GOVERNMENT OF BENGAL.

An Analytical Digest of all the reported cases decided in the Supreme Courts of Judicature in India, in the Courts of the Hon'ble East India Company, and on Appeal from India by Her Majesty in Council. By W. H. Morley, Vol. 1, Part VII.—BY THE AUTHOR.

Tattwabodhini Patriká, No. 93.—BY THE TATTWABODHINI' SABHA'.

The Citizen Newspaper, for Jan.—BY THE EDITOR.

Purnachandrodaya, for January 1852.—BY THE EDITOR.

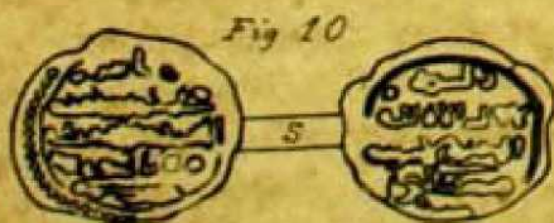
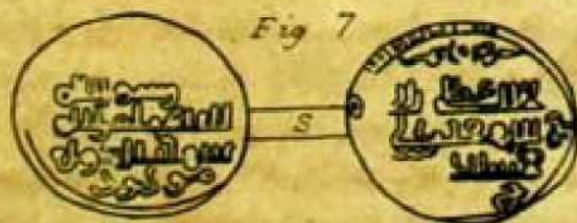
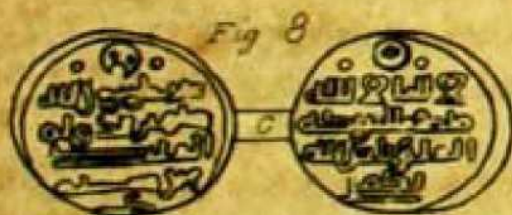
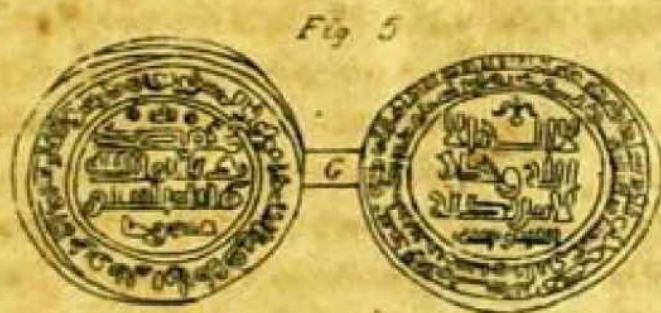
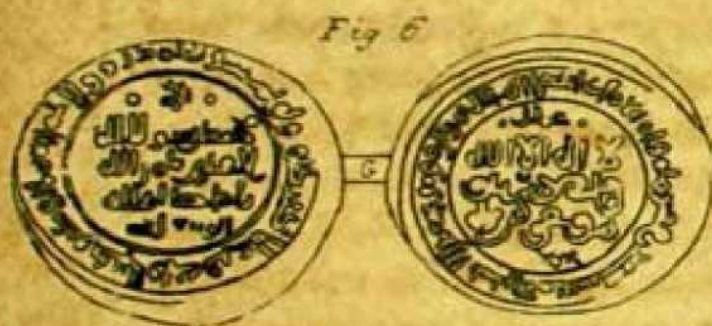
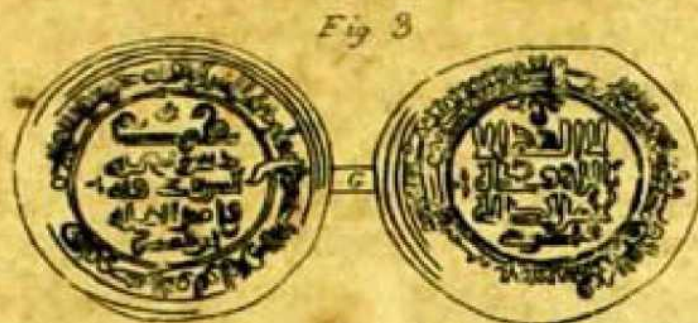
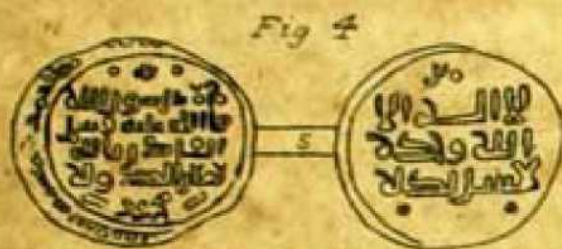
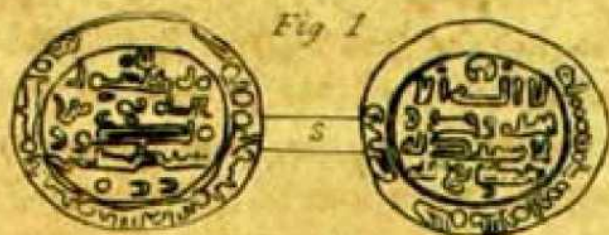
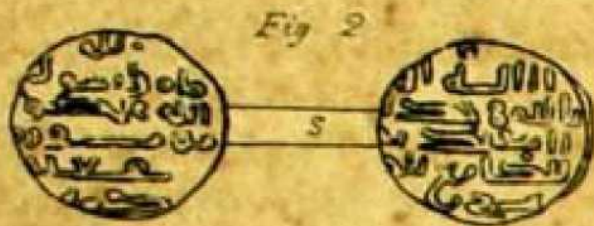
Papers and Proceedings of the Royal Society of Van Dieman's Land, Vol. 1, Parts I. II. III.

*Purchased.*

Scott's Bengal Directory, for 1852.

RÁJENDRALÁL MITTRA.







# JOURNAL

OF THE

# ASIATIC SOCIETY.

No. III.—1852.

*The Kurrukpoor Hills.—By Captain S. R. SHERWILL. (Communicated by Captain THUILLIER.)*

The group of hills lying immediately to the South of the station of Monghyr, and known as the Kurrukpoor Hills, being named after the town which bears that name and which is situated to the East of the hills, is an offshoot from the northern face of the Vindhya Hills, measuring 30 miles in length, with an average width of 24 miles; and although the group in the mass lithologically resembles the Vindhya Hills, it still contains within its valleys and on some of its higher peaks, rocks of a much softer nature, such as silicious hornstone, chlorite, chlorite schist, actinolite, actinolite schist, claystone, hornblende, massive asbestos, and a decaying rock known to the natives by the name of Khari, it is a soft greasy, white, or greyish rock associated with and passing into hornstone.

This group of hills no where rises to a greater height than eleven hundred feet, which is the height of the high table-mountain thirteen miles south of Monghyr, named Maruk; in the interior are extensive valleys, forests, precipices, hot wells, mountain torrents, quarries and a few villages.

The following are extracts from a diary kept whilst traversing these hills:—

*2nd September, 1847.*—Left Monghyr with a party of friends to explore the Kurrukpoor Hills and to visit the sources of the Mun and Anjun rivers, said to rise from hot springs.



Rode to Lallajehangeera, seven miles, situated immediately under the western face of the hills; where there is an Indigo factory and bungalow. The road after leaving the city of Monghyr, passes through fine rice fields the whole way; from Lallajehangeera is a beautiful view of the hills to the south, with Maruk towering over all. Towards the evening visited the Putturkhan valley, two miles from the bungalow and near the village of Mosurgunje; it is a small narrow valley or cul-de-sac in the hills, about three quarters of a mile in length and a quarter of a mile broad, across which and over the hills to the plains on the East, runs a footpath; the pass is called the Umjoorghat. On entering the valley, which you do by a rather narrow entrance, the valley is seen on the right and left and a hill in front closing the view; turning sharp round to the left you find yourself at the foot of a perpendicular wall of a dazzling white quartz upwards of two hundred feet in height, rent into a thousand pallellopipeds by deep fissures and by veins of quartz, all cutting each other with the greatest angular exactness, giving the rock the appearance of being faced with gigantic hatchments whose lower and upper points are angles of  $45^{\circ}$ . This wall faces the east. Immediately to the north east of this wall and across the valley is an old quarry of hornblende, now no longer used; not that it is exhausted, but numerous other quarries being open in different parts of these hills and yielding a superior stone, this one has been neglected; several large slabs of six and eight feet in length were lying outside the valley, they had been quarried for a Mahájun, who dying before he received them, they were left on the spot where they happened to be when the news of his death reached the quarry men. The hornblende is of a fine dark green or blue nearly approaching to black, takes a fine polish, is easily carved, but occasionally fine blocks are disfigured by nests of iron pyrites which being acted upon by the atmosphere and rain, leave large stains of the red oxide of iron on the surface. This hornblende rests upon a schistose rock: it is claystone, which is also found on the opposite side of the hill.

Iron-stone and reddle lay strewed about the valley.

The hills about the quarry are covered with low jungle, stinging nettles, called by the natives Rukusi, and Ferns.

The quartz strata dip  $5^{\circ}$  to the West.

*3rd September.*—Marched to Azimgunje, a small village ten or



twelve miles to the west, lying under the northern face of the hills. The first five miles of our road was through rich rice fields up to the men's knees in water ; when we arrived opposite the Maruk valley, a mountain torrent which descends with great violence from this gap, was found so swollen and deep that we all were obliged to plunge in and swim across ; our road now lay through a handsome forest of mango, acacia, mimosa, phoenix, sakúa, peepul and banian trees, besides sterculia, bauhinea, bamboo, zyzyphi, and butea, both stunted and climbing : the road strewn here and there with quartz rocks.

In the evening went to the Luheytaah quarries where a coarsely granulated quartzose rock is quarried for mill stones. The quarry is on the flank of a long naked quartz rock on the southern face of a detached hill named Juthootteea extending for half a mile through a dense jungle, the naked rock resembling the rounded back of some huge monster. This stone is quarried and taken in the form of native mill-stones to Monghyr, from whence it is exported in great quantities to Bengal and other parts of India. The rock is a porphyritic quartz, with translucent masses of quartz embedded in a greenish grey substance also resembling quartz.

*4th September.*—Ascended the hills by the Gorya Khoh Ghat, a deep wooded glen where hornblende and hornblende slate of a good quality is quarried in large quantities and exported to Monghyr, the associated rocks being chlorite schist, massive asbestos resembling a foliated lithomarge, slightly fibrous when crushed, and clay-stone. The road up the Ghat, which is a mere foot-path, passes over asbestos and clay-stone ; the asbestos is not of the fibrous kind, but appears as an agglutinated species of this mineral. Its general appearance is that of a rock composed of very small and firmly adhering horizontal strata, of about one or two inches in thickness composed of vertical agglutinated shining fibres of asbestos, it is greasy to the touch, its fracture is shining and glossy like silk, streak earthy, colours lively blue, glistening, jasper red or yellow ; near the foot of the hill Maruk, at Maruk Ghat these minute strata are seen in great perfection, having been at that spot denuded by the action of a mountain torrent into a succession of precipices some hundred of feet in height. At the summit of the Ghat we entered a dense forest of underwood and trees, the road winding amongst low hills of asbes-



tos ; at one mile from the crest of the Ghat we passed over laterite, then hornstone of various colors. We were now in a deeply wooded valley of great beauty, the principal trees consisting of Sakua, *Carissa carundas*, *Butea*, *Diospyros*, *Terminalia*, *Grewia*, *Dalbergia*, *Bombax*, *Boswellia thurifera*, *Diospyros ebenum*, a variety of *Bauhinias* both *B. scandens* and *B. variegata*, besides a scattering of *Mimosa catechu*, a wild arrowroot, ferns, *Euphorbia*, *Asclepiadaceæ* and *Liquorice*. As we advanced into the hills the jungles became more and more dense ; about a mile from the top of the Ghat we passed several heaps of iron slag, the refuse of the furnaces of the hill people, who collect the iron ore which is common all over these hills, smelt it in the rudest of furnaces and exchange the metal with the lowlanders for salt, tobacco, or rice ; at the second mile we stopped at a buffalo "baithan" or night rendezvous for buffaloes, by name "Buneeera baithan," changed our clothes, which were dripping wet from rain, drank some milk and proceeded through a narrow valley for two miles to the banks of the hot stream the Anjun, leaving Bhoondh Bhuraree a small village a few hundred yards to our right. Finding a fine deep pool of water in the stream with a temperature of  $108^{\circ}$  completely overshadowed with forest trees, we bathed, a most refreshing proceeding after our long and wet walk ; leaving the road we proceeded to the west, up a densely wooded and narrow valley ; the first part of the road was over a quaking moss bog, through which ran the Anjun ; half a mile brought us to the source of this hot stream which for the last quarter of a mile had become much too hot for our feet. The spot from whence the Anjun rises is at the end of a narrow valley, the water bursts from two orifices in a confused heap of Jaspideous hornstone rocks, bearing a peculiarly desolate appearance from the absence of vegetation on or near the rocks, and from the burnt up appearance of the hornstone from which the water is seen pouring out at a temperature of  $145^{\circ}$  Faht. a fine porous botryoidal silicious sinter deposited from the hot water covers all the rocks near the springs. The Anjun, after a short course of twelve miles, falls into the Nuktee, which latter stream falls into the Keeul a tributary to the Ganges into which it falls at Soorujgurha. A mile and a half brought us to Baboodera and Goormaha, two small hamlets on the banks and in the valley of the Anjun, around which a few hundred acres of land have been cleared, yielding a boun-



tiful crop of Indian corn, junera, cotton, pulse, a small quantity of tobacco, a few chillies and edible roots. The inhabitants principally consist of Sonthals, from whom we experienced every kindness they had in their power to bestow. They gave us a house to sleep in, milk, water and fire; beyond these necessities of life their generosity could not proceed. A tolerable quantity of iron is smelted near both of these villages, generally in the jungle for the sake of being near the spot where the charcoal is burned.

*5th September.*—Started early in the morning to visit the hot springs one mile from the source of the Mun river. Half a mile after leaving Goormaha we passed through a small hamlet Misree Bungla, and entered a very narrow valley in which the Mun takes its rise, densely wooded on both sides, the forest climbing to the summits of the hills both on our right hand and on our left; the rough and unequal road passing over asbestos and hornstone with occasional masses of quartz; when nearing Bheembandh the strata of asbestos are exhibited as vertical lamina, very fine,—of a red, black, blue or grey colour. Two miles and a half walking, during which time we had crossed and re-crossed the narrow bed of the Mun, brought us to the descent into the plains of Kurrukpoor and to the village of Bheembandh, a small collection of huts surrounded by rice fields and palm trees, near which are the hot springs. The first spring we visited is situated about three hundred yards to the North of the village immediately under a small detached hornstone hill named “Mohadewa,” from whose base the water issues in a fine stream at a temperature of 147° Fahrenheit; this was the hottest spring we met with in these hills; the whole of the hornstone rocks over which this water flows appears to be partially decomposed as well as encrusted with a siliceous sinter; a few hundred yards farther to the North, at the foot of the hornstone hill “Dumduma,” we came upon a region of hot springs, hot water appeared to be spouting from the ground in every direction; the principal springs, of which there are eight or ten had a uniform temperature of 145°, all rising within a space of about three hundred yards square. Whilst our party was engaged bathing in the stream containing the united waters of all the hot springs and which falls into the Mun, I made the following observations. At the source of the Bheembandh hot-well at the foot of the Mohadewa hill, the water as before observed



was 147° Fahrenheit. In this temperature nothing appeared to grow or live; at 145°, growing under the water, I found a green slimy moss in full vigour adhering to the hornstone rocks: from 130° to 125° shrubs, trees, grass and ferns grew indiscriminately on the edge of the water, into which they had pushed their roots: at 114° I found large shoals of a very small and active silvery fish apparently enjoying their hot life, but upon being driven up the stream into a higher temperature they showed great distress; at 117° they darted about wildly; at 119° they died instantly; for at this temperature they turned on their backs, their air-bladders bursting a few seconds afterwards; at 120° I found the larvæ of the *Libellula* or Dragon fly as active as these slow creeping creatures ever appear to be, apparently enjoying the high temperature previous to undergoing their final metamorphosis. Frogs were swimming about in 114°; and I found a huge black scorpion and numerous frogs dead in 130°. In 120° I saw a large lizard called by the natives "*Bahumnee*" rush across the stream as if in great agony, he had been scared from the jungle by my servant; with a desperate struggle he got across the stream which was about ten feet broad and a few inches deep: across numerous hot streams are of course many footpaths used by the cultivators round about Bheembandh, but no where at the point of crossing did I find the water above 120° and even that temperature made the men and women hurry across the stream when fording from bank to bank; to our European skins the heat of 120° was intolerable, nor could any of the party walk coolly across any of the fords at that temperature without being severely scalded though not blistered.

Luxuriant crops of rice are raised by the aid of the hot streams, large fields being fed by the water, but at a reduced temperature by leading it in devious courses to the cultivated land.

The united waters of all these hot springs are conveyed away by the small stream called the Mun, which, after a passage through a narrow and densely wooded and bamboo-fringed valley, flows through Pergunah Sukhwabadee to the Ganges, sixteen miles below Monghyr.

From the hot springs we retraced our steps to the Bheemkoond, a small pool of cold water under an overhanging hornstone rock in the river Mun; this pool sacred to Bheem, the Hindu Hercules, a place visited by numerous pilgrims and which we were informed by the





Bráhmans was fathomless, we found by plumbing it by the aid of a long jungle creeper charged with a heavy stone to be only thirteen feet deep. The falsehood of these men is only to be equalled by their impudence, for they declared we never reached the bottom.

A few hundred yards from this pool and down the stream the asbestos changes into actinolite where it is seen in columnar masses from ten to fifteen feet in height, and when decayed is of a bright yellow, red and bluish colour; the living rock is of a pale emerald green with glassy fibres; this mineral is also found in the bed of the Anjun nullah where the stream leaves the high land through a narrow gap in the hills named the "Kookur Jhup or the Hound's leap."

6th September, 1847.—Left Bheembandh early this morning; leaving the hot wells on our left, we struck into a valley flanked on the right by the Ghordour hill and on the left by the Gorya hill, both of hornstone, and well wooded; at one mile ascended the Kohburrun hornstone hill to the crest of a deep and beautifully wooded dell named Narookole; from the summit of the pass the view was particularly pleasing, though nothing but dense forest and hills meet the view; descended the Narookole path down to a grass-clad valley through which the Sundasin nullah finds its way to the plains of Kurrukpoor. After a very wet walk in the tall grass between the Keel Tokwa hill on the right hand, and Sundasin hill on the left, and after crossing and recrossing the stream numerous times, we were fairly brought to a stand still by our guides pointing to a nearly perpendicular mountain over which they told us we must climb. We tried many points to endeavour to find a passage for a couple of ponies that were with us, but without success; they were obliged to retrace their steps and to go round several miles to the Suwasin pass over which they eventually made their way. As we mounted the steep Keel Tokwa, we perceived that the Sundasin nullah flowed several hundred feet below us in deep shade through a gap in the hills for nearly half a mile in length, the sides of which were quite perpendicular, and not more than a few hundred yards apart; the gap has the appearance of being a volcanic rent in the white hornstone rocks which are prettily fringed with *Sterculia*, *Boswellia* and *Butea*; from the highest point in our passage over the Keel Tokwa we had a capital view of the greater part of the jungles to the West.



Descended a stony pass strewn with quartz, hornstone and iron ore, to Soogee, a small hamlet situated on a rising ground where iron is smelted; it stands on the banks of the Dhodhanee nullah in whose bed I found a bed of a white schistose rock, greasy to the touch and resembling the asbestos of Bheembandh.

7th September, 1847.—Travelled this day over broken and uneven ground covered with a dense forest of fine trees, the rocks being quartz, hornstone, claystone and iron ore; the forests composed of a few fine trees of sal, (*shorea robusta*), fit for beams of the largest house, with an abundance of *Sakúa*; \* *carissa carandas*, or wild corunda, with a delicious perfume; *butea frondosa*; *diospyros ebenum*, or ebony, *asun*, *terminalia*; *phalsa*, *grewia*; *sisoo*, *dalbergia*; *semul*, *bombax heptaphyllum*; *salu* or *sale*, *boswellia thurifera*; *keonjee*, *sterculia*; *euphorbia* of a large size; *aonla*, *myrobalans* *phylanthus emblica*, *ku-dum*, *nauclea*; *chironjee*, *c. sapida*; *bel*, *ægle marmelos*; *mynphul*, *vangueria*; *aheens* or *mukkoh* or *kuttow*; *dhaw*, *grislea tomentosa*; *dhaumin*; *panun*; *ghumbhar*; *koosoom*; several *bauhinias*; *koom-bhee*; *umultas*, *cassia fistularia*; and in the deeper glens and vallies were *asclepiadea*, *liquorice*, *turmeric*, and ferns of several kinds; of the latter, the *adiantum* attains to a large size and great beauty, large ferns were observed growing parasitically on trees.

A rough and steep scramble through these trees brought us to the summit of the hill Maruk, a table-topped hill of eleven hundred feet elevation, from whence we had a splendid view of Monghyr station and town thirteen miles to the north of us; of the country beyond the Ganges; or nearly one hundred miles of the Ganges; winding through the highly cultivated plains of the districts Patna, Monghyr, and Bhaugulpore; a good view of the Rajmahal hills to the East, distant seventy miles and of the jungles at our feet, clouds shut out the view of the Himalaya mountains which a few days before we had seen from Monghyr in the plains, spread out in a vast panoramic view, their snowy sides tinged with the beams of the rising sun.

The summit of this mountain is about a quarter of a mile in length and a few hundred yards in breadth, perfectly level and covered with a matted and tangled jungle of bamboos, *mimosa catechu*, and *sakúa* trees. The spot, from its elevation deserves to have a house or two erect-

\* *Shorea robusta* in its early growth.



ed on its summit where invalids from Monghyr would, during the great heats of summer find relief from the difference of temperature.

The summit of the mountain is composed of a coarse ferruginous nodular clay somewhat similar to laterite, resting upon asbestos, which lies upon hornstone, and beneath all, quartz rock, the strata of which dip  $85^{\circ}$  to the south-east, direction of strata north and south. It is difficult to say where the quartz commences or the hornstone ceases, as they pass into each other by such gradual gradations.

Looking north and down into the jungle, large bare masses of quartz rock are seen protruding through the surface of the country and overtopping the highest trees, with a dip in the strata of  $80^{\circ}$  to the north-east.

The ferruginous clay-like laterite at the summit of the mountain is excavated into natural caves highly polished by the frequent visits of the long-tailed monkeys which abound in the woods in these hills.

On the summit of this mountain we fell in with several of the gigantic yellow webs of the epeiræ spider, which are as remarkable for their strength of web as they are for the variety of their forms and colors; the present specimens were red and black, of a formidable size and very active; some of the webs we found stretched across our path measuring from 10 to 20 feet in diameter, that is, including the guy ropes which are fastened to some neighbouring tree or clump of bamboo; the reticulated portion being about five feet in diameter, in the centre of which the spider sits waiting for his prey. The webs from their great strength offered a sensible resistance when forcing our way through them; in the web of one of the spiders we found a bird entangled and the young spiders about eight in number feeding upon the carcass. The bird was, with the exception of his legs and beak, entirely enveloped in web, and was much decomposed; the entwined web had completely pinioned the wings of the bird so as to render his escape impossible. The bird was about the size of a field lark and was near the centre of the web; the old spider was about a foot above the bird; we secured, measured and bottled him. His dimensions were six inches across the legs; he was armed with a formidable pair of mandibles.

During the day, cleared the jungle around the Trigonometrical cairn, and towards evening commenced building a temporary hut of boughs and bamboos to sleep in. At sunset, set fire to the jungle that we had cut down and which we had piled to the height of 30 feet, somebody volunteering a clean dry shirt to light the fire with, as every thing



had during the day become wringing wet from continued heavy rain, the fire rose into a magnificent blaze, and was visible for seventy miles. During the night the rain descended in torrents, broke into our bough hut and deluged us; the morning's light showed the whole party of six individuals lying in very thin mud, and thoroughly drenched to the skin.

*8th September, 1847.*—Descended Maruk hill on the Northern face by a very steep and difficult footpath through a dense forest and rode to Lallajehangeera.

*9th September, 1847.*—From the Lallajehangeera bungalow a footpath leads over the hills, (from the summit of which is obtained a beautiful view of the Ganges and country in general) to the hot springs of Rishikoond, which rise from several springs on the eastern side of the hills at a temperature varying from cold water to 104°, which gush out with a fair body of water from the foot of the Jaspideous hornstone hills. The springs are in a prettily secluded nook in the hills, well filled with spotted deer, jungle fowl, a few tigers and bears.

This spur of the hills forming the eastern horn of the recess named Maruk, and upon which the Fort of Monghyr is built, extends to beyond the Ganges where it appears as several naked quartz rocks, one of which standing in the middle of the Ganges, causes the destruction of numerous boats during the rains, when the river rushes over it with a great noise, heard at the distance of several miles. At Monghyr the rock is quartz, several outcrops of which are seen in the fort and which are said by the natives to increase yearly in size, by a gradual upheaval. The foundations of the north-western bastions are all based upon the quartz rock, otherwise the fort must long ere this have been swept away by the great force of the current; some rocks in the bay have caused damage to several steamers, which might be obviated by a buoy or flag being attached to each hidden danger. The small hill named Peerpuharee about three miles east of the station, forms the most northern point of the Kurrukpoor hills, where it terminates in a perpendicular bluff overhanging the old bed of the Ganges; the quartz is white and glossy, traversed by numerous veins of milk-white quartz running north-west, south-east. Crossing these veins at acute angles are many veins of a black iron ore having the appearance of having been infiltrated from below in a gaseous form. Near the summit of the hill where the slope has been cut away to form the road, a bed of massive asbestos with ribbon-like strata has been cut through; penetrating this mineral are delicate veins of hornstone much contorted,



the whole bed dipping to the south  $45^{\circ}$ , direction of strata S. W. N. E, The asbestos pounded feels soft and is slightly fibrous; associated with the asbestos is indurated talc, in amorphous masses, it writes upon glass, which writing is invisible until breathed upon.

At the southern foot of the hill is a bed of chlorite and hornblende schists, but no where possessing fissility sufficient to render the slates of any use. On the north-western side of the hill I found a conglomerate of rolled pieces of asbestos, chlorite, hornblende, quartz and hornstone united with a calcareous cement, the bed extending for thirty or forty yards along the base of the hill.

Leaving Peerpuharee hill and proceeding in a southerly direction across a cultivated plain towards the hills, the same quartz is again met with, over which a red clayey and gravelly soil containing nodules of iron ore is thinly strewed; it is in this plain that the Seetakoond hot springs take their rise from a group of hornstone rocks, barren and sterile in appearance. The temperature of the spring is  $140^{\circ}$  and seldom varies.

Six miles from Peerpuharee in a direct southerly direction, is a small fault in the hills which serves as a ghat or passage through the range, the name of the gap is "Dusdooar" and is in ribbon claystone, wedged in between quartz and hornstone; from this handsome stone which exactly resembles unbaked and unsilicified ribbon jasper, was built the greater portion of the Monghyr Fort, and considering its great softness it is wonderful how it has lasted so well and so long as it has done; its colors are exceedingly lively and are pearl-blue, brown-red, yellow, bright-red, and lavender-blue; the fracture is dull earthy, with glimmering particles, probably silvery mica, but much too small to be discernible even under a powerful lens; this claystone passes into massive asbestos.

In the small Kewar Kole valley containing the Rishikoond hot springs, is a curious cleft in the hornstone rocks twenty-five feet in width forming a series of cascades. The strata dip  $2^{\circ}$  to the north. Higher up the valley large masses of hornblende appear, evidently belonging to the same strata quarried on the opposite side of the hill at Puttur Khan. Quantities of iron ore lie scattered about the small valley, but greatly hidden by the luxuriant foliage of the elegant trumpet-flowered *Hastingsii* which was in full blossom in March, the period of our visiting the spot.



A few miles to the south and situated in a dense forest is the Ghora Khood, a wide cleft in a perpendicular and naked wall of a pure white and rose colored quartz, intersected in every direction with broad and narrow veins of milk-white quartz ; this cleft has the appearance of having been violently effected by the sudden bursting through this natural barrier of a large body of water, which must have accumulated in a deep valley immediately to the west or behind the wall. During the rainy season the water from this valley rushes through this gap with amazing fury forming a small cascade.

Hindu tradition asserts that the wall was broken down by a blow from the foot of a Rajah's horse when out hunting in these hills ; the impress of whose hoof is still to be seen on the summit of the rock.

At Pandu, a small village to the south of the hills corundum has been found, but I could not discover the spot from whence it is procured.

To the west of the hills in a valley, shale was reported as having been discovered, but, as neither specimens nor locality were ever seen by me, I am unable to say how far true the report may be.

*Produce of the Kurrukpoor Hills.*

Timber of various sizes, none very large, principally sál, sakúa, asun, dhao, khoombhee, muhooa, plas, sissoo, ebony, which are principally used for native hut building, for ploughs, bedsteads, pestles and mortars, yokes, masts for small boats and firewood ; bamboos in great quantities ; several barks, dyes, gums, and grass.

Hornblende slates ; millstones, curry-stones, iron of a good quality, khari, a white earthy substance used for whitewashing buildings and for ornamenting pottery. Building stones of various kinds, such as claystone, massive hornblende, and hornstone ; the hornblende is also used for tomb-stones, plates, dishes, sun-dials, and is much exported to all the large cities ; corundum.

A vein of argentiferous galena was discovered at the base of these hills in 1847, but as the discoverer keeps the site a secret, no more can be said about the matter, the ore was tested in Calcutta and found to contain much silver ; a dispute about the title-deeds of the village lands is the cause of the secrecy in the matter.

A large amount of treasure is said to be hidden in the valley of the Mun, deposited there during troublous times by the Rajahs of Kurrukpoor. Europeans have searched for the spot and have failed in their search.





**LEBBEY**

*The "Abéu" or Chief of the Bookee Clan  
of the*

*Hammah or Shendons*



*Notes on the Heumá or "Shendoos," a tribe inhabiting the hills North of Arracan. By Capt. S. R. TICKELL, 31st B. N. I.*

The immense tract of forest and mountains, intervening between the valley of the Irawaddy in Burmah, and the alluvion of Arracan, is inhabited by wild and partly independent hill tribes, whose intercourse is confined almost solely to themselves; the communications of each class being limited to the neighbouring one. Those bordering on the populous and comparatively civilized tracts under our Government, have been described [I believe in the pages of this journal] by more experienced narrators than myself. But some of the more remote and wild sub-divisions of these people have not yet come within observation, and amongst these the Shendoos, though well known by name and repute in Arracan, have never yet been visited by the people of the plains, nor has a single specimen of this race been seen, I believe, either by Mugh or European in Arracan, until 1850 when two emissaries or spies from them met me at a hill village some distance up the Koladyn river. And again this year, when two more, a chief and his follower ventured as far as Akyab itself, and from these I collected the few details here given of this people.

The Koladyn or Gyatchafa river runs in a direction from N. N. W. to S. S. E. At about 80 miles from its mouth the alluvion ceases, and a mass of hills abruptly commences without any undulating or table-land between. The ranges are low with insulated bordering patches at first, but soon rise in mass after mass—tier upon tier—to the Yeomatoung range to the Eastward, and the "Blue Mountains" on the Chittagong side. These hills are chiefly (if not entirely) of sandstone, excessively steep, buried in jungul, and contiguous, leaving deep narrow water-courses between. The two largest of these, directly tributary to the Koladyn are the Peekhyoung, falling into it at its right or Westerly bank in Lat.  $21^{\circ}$  N. and just where the hilly country begins, and the Meekhyoung entering on the opposite shore in about Lat.  $21^{\circ} 15'$ . This (the latter) stream which is about a hundred yards wide at its mouth and very deep, runs from a N. E. direction between steep-rounded hills for about 10 miles from the inlet, and then trending gradually round comes down from due North, collecting



its waters by the confluence of innumerable water-courses trickling from masses of high hills—about  $21^{\circ} 50'$  N. Lat. inhabited by the "Koon" tribe: (The people lower down south and nearer the Koladyn being called "Koomwees.") To the North and N. E. of the Koons the hills rise higher and higher, and amid this region, circumscribed by a space which, from all the information I can procure, I place between Lats.  $22^{\circ}$  and  $23^{\circ}$  N. and Longs.  $93^{\circ}$  and  $94^{\circ}$  E. lies the country of the Shendoos.

This mountainous tract appears in Pemberton's map to be bounded to the East by the Nankathey khyoung, or Munipore river: but in all other directions it mingles indefinitely with other ranges, and an unbroken extent of forest.

The Shendoos, or, as they style themselves, the "Heumá," are subdivided into several classes: my informant Lebbey, was the chief or "Abeu" of the one nearest to the Koons, by name "Bookee," consisting of 350 houses, all in one village.

The others of his people or nation, he gave me the following list of, describing each class as lying further and further to the N. E. but of the distances between each, I could gather no information—beyond that, the last one on his list, was as far from his village on the one side, as Akyab on the other, and the last he stated himself to have been thirteen days in reaching. Next to Bookee is—2. Thubbau, presided over by Tynkho and Wantlye Abeus; consisting of 400 houses, in two villages.

3	Lalyang,	Tawho Abeu,	100 houses.
4	Tumboo,	Khooloung Abeu,	100 houses.
5	Roongfe,	Shíkho Abeu,	50 houses.
6	Yanglyng,	Khenoung Abeu,	250 houses.
7	Hoothé,	Kheachoo,	240 houses.
8	Mowtoo,	Gebbo Abeu,	500 houses.
9	Tantlang,	Whuhnyn Abeu,	600 houses.
10	Hekká,	J'hachow Abeu,	

This last town is described as containing 2,000 houses!—as being in entirely open country and clear of all the hills—and as having much cultivation about it. The inhabitants, said Lebbey, use carts and ride on horses, and the Shendoos pay tribute to their chief. My informant had never been himself further than Mowtoo, and spoke of Hekká



from hearsay, but emissaries from the last mentioned place had been as far as his town of Bookee, demanding tribute, which they had received last year from him in the shape of a musket, a dog, a large pig, and a bundle of cotton-thread and one of cotton-wool from each house.

From these particulars I am inclined to suppose Hekká is not a Shendoo town at all, but a district in Burmah. In Pemberton's map the only name resembling this that I can find is "Aika" which does not however appear marked as the capital of any division or district, and is moreover some way to the S. E. of the Shendoo mountains, about  $94^{\circ}$  E. Long. and  $21^{\circ} 40'$  N. Lat. quite out of the direction described by my informant. It appears moreover that the people of Mowtoo, Tantlang and Hekká, speak a different dialect to the Heumá language. This may probably then be Burmese, but Lebbey's entire ignorance of that language prevented my ascertaining this point.

The houses of the Heumá, he tells me, are made of timbers by the more opulent, and of bamboos by the poorer classes; thatched with grass, and all on raised platforms, a peculiarity common to the Mongolian races from eastward of the Hindu Koosh down to Borneo. They are rich in poultry and pigs, and cultivate the grains usually raised in jungly hills, such as maize, bajra, and hill rice, [of this but little], also plantains, yams, kudoos, ginger, cotton, til, linseed, and sugar-cane, [of which they make no use beyond eating it in its natural state.]

They prize dogs as food, and also all sorts of game [deer, wild pigs, &c.] and elephants, the flesh of which they are very fond of. With fish they are almost unacquainted, having indeed no other name for it, than the Burmese one of Ngá.

The elephants are generally shot with large heavy arrows, set in trap bows of immense size, the plan of which by description must be very similar to that of the bows set by our Bughmars in India. The Shendooos however set two, pointing inwards, both connected by the same line that pulls the trigger, so that the animal passing through or touching the line with his foot, receives an arrow into each side. This double dose is the more necessary, as the Shendooos appear quite unacquainted with the use of any venomous poison. Elephant's teeth form one of their principal articles of barter.



Commerce, with this wild people is of course extremely limited; their imports are passed from village to village, few of the more civilized people of neighbouring countries caring to pass far into the interior of a race which they look on with such dread. Lebbey informed me, the people of his class, took annually to the Koon frontier, elephants' tusks, gongs, [which they get from the province of Yeo in Burmah], bee's wax, home spun plaids, and cotton turban cloths; which they exchange for salt, muskets, cloth, coral and bead necklaces, lead, powder, brass kutoras and thalees, and brass rings. I was curious to know where they got the brass from, which adorns their shields, but could get no information more lucid than that it came from a country, one moon's journey to the N. or N. N. W. which was governed by a woman!

Their weapons are bows and arrows, [small, and becoming fast superseded by muskets,] short spears, and shields made of buffalo hide ornamented with brass plates and tufts of goat's hair dyed scarlet.

These people are polygamous, having from 2 to 4 wives each; the number being solely limited by the length of the purse. They purchase them from their parents with gongs, cloth, &c. the largest price being paid for the first wife and less for those subsequently added to the household.

They may marry two sisters at once, but not more, and unlike their southern neighbours, the Koomwees, are prohibited from taking to wife their step-mothers. Daughters are entirely excluded from succession to property, every thing goes to the eldest son. If he be a minor the uncle, or if there be none, some one next of kin, takes charge of the property, which, however, he is not called on to account for afterwards unless he choose! If the eldest son have married and settled in life at his father's death, he gets no property, and the whole of it is divided amongst his younger brethren. Should there be none however, he succeeds to it. In no case is anything left to the widows; they are turned adrift, or left to the charity of the eldest son. They bury their dead, digging a hole in the ground to the depth of a man's height, which is paved with flag-stones and lined with boards, into this the corpse is placed in a supine posture, head to the east, together with the deceased's weapons, gong, &c. The hole is then covered with strong sticks, plants, earth, and over all, a large stone.



The body is kept two or three days in the house after death, but without any embalming or other preparation, so as to become often quite putrid before interment.

The Abeu or head of the clan dispenses justice. Theft is punished by the restoration of the property stolen and fine equal to its value.

For murder, the punishment is making over to the relatives of the slain, a number of slaves, from two to seven, according to the wealth or importance of the deceased, and pigs in the same proportion. Should the offender not have slaves, he must give up property equivalent to them, or, in default, his own children. If he have neither slaves, other property, nor children, he is slain by the nearest of kin to the deceased with the weapon by which the murder was committed. But this is an event of such rare occurrence as to be, so to say, matter of legend. Drunken quarrels attended with affray and wounding are of frequent occurrence: but no murder had been committed within my informant's recollection.

The Heumá were formerly at war with the Koons, but now appear to be at peace with them and all the tribes to the south or along the Aracan frontier; but they have constant fights with other tribes, whose language, my informant said, was strange to him.

These people lie to the N. E. and E., and have their legs tattooed like the Burmese. Lebbey stoutly denied having made any excursions for slaves lately, and insisted that all those slaves in his village, were descendants of people captured generations ago. But he confesses that Shendoos have carried off slaves from Chittagong rather recently, and enumerates the following tribes as having been concerned in these forays. Yanglyng (before mentioned), Roopoo [Tynkho Abeu,] a clan living to the N. W. of the sources of the Koladyn; and Tongshé, [Ekké Abeu,] a clan of about three hundred houses, North of Bookee.

Of the theological notions of the Shendoos I could gather but very meagre information. They regard the sun [Nye] and the moon [Khiapá] as deities, and sacrifice pigs and cattle to them at the commencement of the rains. They have no divisions of time, except by seasons, distinguishing these by the different stages of agriculture proper to them, ploughing, sowing, reaping, clearing jungle, &c.

Lebbey is a short, rather muscular man, with the well developed thighs and calves of hill people in general, and a pleasing expression





of face, not so markedly Mongolian as the countenances of many of the Aracanese; but his follower had the broad flattened features to a much greater degree.

I append a short vocabulary, and a few of the commoner sentences in their language, which has no written character. The dialect is exceedingly guttural, gh being exactly rendered by the Arabic *ġ* and kh by the Persian *خ* while in their vowel sounds *éu* and *ú* have precisely the sounds of the French vowels in *deux*, and *u* in *flute*, &c.

*English.**Heumá.*

A man.	Ché.pá.
A woman.	Ché noung.
A boy.	Methá.
A son.	(The same).
A girl, or daughter.	Chenoungtá.
A father.	Eúpá.
A mother.	Oonau.
A chief.	Abéu.
A wife.	Peenoung.
A good man.	Chepá p'há
A bad man.	Chepá p'hachoo or p'hawé
My.	Kummá.
Your.	Nummyng.
Large.	Lépee.
Small.	Chotá (!)
A village.	Koo.
A hill.	Kló.
A forest.	Roley.
A stream.	Pevá.
Rain.	Avéu.
Wind.	Klúhhóo.
A dog.	U.
A fish.	Nga (as the Burmese ငါး).
A pig.	Vo.
A cock or hen.	Ah.
An elephant.	Múshéy.
A tiger.	Chukóm.
A monkey.	Ayaw.





A bird.  
A snake.  
Hungry.  
Dead.  
Black.  
Red.  
White.

Tuvá.  
Púrrea.  
Manoot'há.  
Muddéu.  
Avóng.  
Ashé.  
Agnó. (The Burmese naso-palatal  
sound of  $\text{ḡ}$ )

Green.  
Come along.  
Sit down.  
Stand up.  
Speak.  
Don't fear.  
Go along.  
What is your name?  
Where is?  
Eat.  
Drink.  
To sleep.  
To lie down.  
"They say,"—"It is called,"  
"videlicet," &c.

Amé.  
Vévau.  
Atúgh ( $\text{ḡ}$ )  
T'haó.  
Choré.  
Cheekó.  
T'hé ow.  
Numamé ho mo.  
Kuché ma-aw.  
Longatee and Loonétee.  
Niá.  
Yé shee.  
Moungta shee.  
Puttee.

*Numerals.*

1—Mékhá.  
2—Mé ny.  
3—Mé t'hao.  
4—Mé pullee.  
5—Mé pá.  
6—Mé churroo.  
7—Mé sharree.  
8—Mé charia.  
9—Mé chuckoo.  
10—Mé hrá.  
11—Hlékhá.

12—Hlé ny.  
13—Hlé t'hao, &c.  
20—Mé kú.  
30—Shaw t'hao.  
40—Shaw pullee.  
50—Shaw pa.  
60—Shaw churroo, &c.  
100—Yá khá.  
200—Yá ny, &c.  
1000—Sho khá.



*On the Sites of Nikaia and Boukephalon. By Major JAMES ABBOTT, Boundary Commissioner, Punjab.*

In a Map of the Punjab of A. D. 1849, dedicated by Arrowsmith to Baron Hügel, which appears to be an edition of that Topographer's former admirable chart disarranged and vitiated by the subsequent blunders of travellers, I observe that the site of Nicæa (meaning of course Alexander's city, Nikaia), is placed upon both banks of the Hydaspes, about a mile and half below Russool.

In another map of the Punjab published by Walker, I observe a site or fort designated Tukht i Sikundur (i. e. Alexander's Throne), about 6 miles S. East of Jelum, on the Eastern bank of the Hydaspes. The latter site caught the eye of one whose authority every soldier must reverence, and led that highly-gifted genius to surmise, that this Tukht i Sikundur marked the crossing of Alexander when invading the dominions of Porus. Finding myself in the neighbourhood of both spots, I have carefully explored the ground and cross-questioned the inhabitants as to their traditions.

The Chuk Sikundur, then, (or, hamlet of Alexander, for Tukht (or, the throne), is a pure invention of the Topographer,) is the ruin of a small mud castle, built by the Sikhs upon the site of a hamlet of that name, about fifty yards long by thirty wide; standing upon the elevated soil at the eastern edge of the basin of the Hydaspes, and distant about two miles from the river. The hamlet received its name from the founder, one Sikundur Khan, a Mogul of Delhi, who about seven generations back came and dwelt there. His descendants still occupy his rights, and are happy to show their mud huts to the traveller, who may have been led thither by the blunders of Topographers. It is called Chuk, or, the hamlet, because subordinate to the main village, Sikundurpoor, standing close to it. The coins procured for me from this site by means of handsome rewards, are all of dates greatly posterior to the Greek dynasties. Thus vanishes for ever the legend of the Tukht i Sikundur.

I have examined most carefully every village and old site upon the eastern bank of the Hydaspes, from old Jelum (Nikaia) to the site lately adopted by Arrowsmith as Nikaia, about a mile and half South



of Russool. In his older and correcter map, when under the guidance of better authority, he placed Nikaia where I believe it to have stood.

In order to consider the arguments for either position, let us first determine the point at which Alexander crossed the Indus. Abisares,\* we all know, was king of the mountainous Indies of the Punjaub, i. e. either of Huzara and the mountain tract enclosed by the Indus and Hydaspes, or of that and of the Juppaul and Jumboo mountains. In the latter case, he probably held also Cashmere.

Now, in invading the Assakanoi,† Alexander had to cross the river Gouraios, difficult of passage owing to its depth and current, and the round and slippery boulders in its bed. This river, says Arrian, is called after the people, Gouraioi, of that country. The Gouraioi, called to this day Gour, still dwell upon the Sohaut river, improperly called in some Maps‡ Loondi, and the river to this day bears, as one of several names, the title of Punjgowrá, from a town of that name on its bank inhabited by the Gour tribe. Here we have an undoubted landmark. Again the barbarians escaping from Massaga§ designed to take refuge first in Ora; but eventually fled to Abisares. Alexander marched to Ora, and then besieged Bazira, and the fugitives from Bazira fled to the rock Aornos,|| whose roots (see Curtius) the Indus enters.¶ It is manifest therefore, that the river Gouraios, that

\* Arrian calls him τῶν ὀρείων Ἰνδῶν βασιλεύς. v. 8.

Curtius says: Abisares et Porus erant: sed in Poro eminebat auctoritas. Uterque ultra Hydaspem amnem regnabat. viii. 12.

Strabo says: Ὑπὲρ δὲ ταύτης ἐν τοῖς ὄρεσιν ἡ τοῦ Ἀβισάρου χώρα, παρ' ᾧ δύο δράκοντας ἀπήγγελλον οἱ παρ' αὐτοῦ πρέσβεις τρέφεσθαι, τὸν μὲν ὀγδοήκοντα πηχῶν, τὸν δὲ τετταράκοντα πρὸς τοῖς ἑκατὸν, ὡς εἰρηκεν Ὀρησίκριτος. Vol. iii. lib. xv. cap. i. p. 269, Ed. Tauchnitz. Such monsters are wholly unknown in this region at present.

† Ἦγε δὲ διὰ τῆς Γουραίων χώρας, καὶ τὸν ποταμὸν τὸν ἐπάνυμον τῆς χώρας τὸν Γουραῖον χαλεπῶς διέβη, διὰ βαθύτητά τε καὶ ὅτι ὀξὺς ὁ ῥοὺς ἦν αὐτῷ καὶ οἱ λίθοι στρογγύλοι ἐν τῷ ποταμῷ ὄντες σφαλεροὶ τοῖς ἐπιβαίνουσιν ἐγίγνοντο. Arrian lib. iv. cap. 25.

‡ This river becomes the Loondi when all the streams are united, that is, after joining the Kabul river; at Julalabad it is the Nagooman.

§ Ταῦτα μαθὼν Ἀλέξανδρος, ὥρμηται μὲν ὡς ἐπὶ Βάζιρα· γνοὺς δὲ ὅτι τῶν προσοίκων τινὲς βαρβάρων παρίεναι ἐς τὰ Ὁρα τὴν πόλιν λαθόντες μέλλουσι, πρὸς Ἀβισάρου ἐπὶ τῷδε ἐσταλμένοι, ἐπὶ τὰ Ὁρα πρῶτον ἦγε. ib. lib. iv. cap. 27.

|| Ἐφευγον (i. e. οἱ ἐν τοῖς Βαζίροις) ἐς τὴν πέτραν τὴν ἐν τῇ χώρᾳ, τὴν Ἀορνον καλουμένην. ib. lib. iv. cap. 28.

¶ Petra non ut pleræque modicis ac mollibus clivi in sublime fastigium crescit,



to break up the boats,—the larger into three pieces, the smaller into two,—and to bring them on carts to the Hydaspes.

Now, had Alexander with the main army reached Tukht Purri,\* which some conceive to be Taxila, the danger for Huzara had for the present been past. Moreover that Lower Tukht Purri, which is eighty miles from the Indus, appears to me inconveniently distant from the board of works. I think Hussein Ubdal, the delight of travellers upon that road, thirty miles from the Indus, and, until the last twelve years, the chief town of the Tarkhaili clan, from whom it was wrested by the Sikhs, a more probable locality. For although Taxiles (the Tarkhaili) was one of the two principal chiefs of that Doaba, yet we have no reason to suppose that he was king of Potawar,† an immense tract abounding in warlike inhabitants. Gamaxus, we see, opposed Alexander, although Taxiles had submitted; and I am inclined to think that Taxiles' own territory was bounded Eastward by Chehlo Jungi between Rawul Pindi and Jain ké Sungh.

However that be, there were two routes from either to the Hydaspes for the train of carriages containing Alexander's boats: the shorter to

καὶ ἐκομίσθη αὐτῷ, ὅσα μὲν βραχύτερα, διχῇ διατμηθέντα, αἱ τριακόντοροι δὲ τριχῇ ἐτμήθησαν, καὶ τὰ τμήματα ἐπὶ ζευγῶν διεκομίσθη ἔστε ἐπὶ τὴν ὕχθην τοῦ 'Υδάσπου' καὶ κεῖ ξυμπηχθὲν τὸ ναυτικὸν αὐτοῖς δὴ ὁμοῦ ὤφθη ἐν τῷ 'Υδάσπῃ. Αὐτὸς δὲ ἀναλαβὼν ἦν τε δύναμιν ἔχων ἦκεν εἰς Τάξιλα, &c. *ib. lib. v. cap. 8.*

\* Tukht Purri, the stone throne, or, more properly, Turrak Purri, the Hyæna's rock, is a large village built a mile and a half south of the high road and amongst the ravines. Those who would boast its antiquity say that it was founded by a Gukka faquir named Sheikh Gukka, and called Turrak Purri on account of a mischievous hyæna which haunted the spot. Others say it was founded in the reign of the emperor Hoomaioon, about 320 years ago, by Tukht Banou, princess of Sooltaun Audum Gukka, and called after her, Tukht Purri. Purri is a common terminal to towns here. It signifies a slab of rock. Turrak Purri has no appearance of antiquity, nor do its most enthusiastic admirers claim for it an origin anterior to the invasion of Mahmood Ghuznavi. Its position is unfavorable to commerce; lying off the main road and amongst impracticable ravines. To suppose these ravines formed since the erection of the city, is to suppose the city built previous to the existence there of the water, upon which it is dependent; that water rising in one of the ravines. Two thousand years is a long period in the estimation of man; but absolutely nothing as regards the face of nature, in which it produces no visible wrinkle.

† Arrian calls Taxiles the Hyparch of Taxila; and Curtius, speaking of Porus and Abisares says, Sed in Poro eminebat auctoritas.



the present town of Jelum, the longer to the modern village of Julalpoor. Upon one of these places he must have debouched from the table-land of Potawar. Each had its ferry. But between the ferries there is no comparison; that of Jelum being infinitely more convenient and only one-third the width of the Julalpoor ferry.

Let us, however, suppose that he carried his pontoon train twenty needless miles by Julalpoor, and chose to encounter rather than shun the quicksands of the torrent Hurrund, which at that season (the monsoon) are a serious impediment to beasts of burthen and wheel carriages. On arriving he would have found Porus encamped upon the eastern bank of the Hydaspes; near the present village Duttoo Choor. It was the height of the monsoon, and Alexander there found the Hydaspes four stadia or 833 yards, i. e. half a mile in breadth, according to Curtius.\* But I measured it even in February, after a fall of rain, immediately above that point, one half mile in breadth, and during the monsoon it is considerably more. Curtius† also says, it was thickly studded with islands, to which the youth of either army swam to skirmish. But at present, during the monsoon, there is not an island there. At Julalpoor the salt range comes down almost to the water's brink, and this is the case to the distance of eight miles higher up, affording Alexander such a bird's eye view of the whole river, as had made it impossible for him to mistake an island for the main land. Neither Arrian nor Curtius indicates the flank to which Alexander's movement was made. But although several travellers have supposed that it was to his left flank, none has hitherto imagined it might have been to his right flank. Let us therefore examine the ground to his left flank: that is, further up the stream. So far as I can judge, it seems probable that the river there approached to contact with the mountain spur at Murriali and at Julalpoor. It will be seen by the sketch map accompanying (which is not constructed from a regular survey) that it has receded to the East, and left a slip of Kándá land varying from 400 yards to a mile. Now if we measure eleven miles from Julalpoor in this direction, i. e. up the stream, it

\* Quatuor in latitudinem stadia diffusum profundo alveo et nusquam vada aperiente, speciem vasti maris fecerat.—Qu. Cur. lib. viii. cap. 13.

† Erant in medio amne insulæ crebræ, in quas Indi et Macedones nantes, levatis super capita armis, transibant. ib.



brings us to about Darapoor, where there is a ferry. Darapoor, an insignificant village, stands upon an old but small site, apparently that of a village, and is said to have been built about 150 years ago by one Dara Khan. The name signifies the town or village of Darius. Opposite is Russool upon a very lofty cliff, beneath which in the monsoon a branch of the river flows. This cliff scarps to the West that rising ground, the last glacis of a long ridge of Kunka\* and clay of small altitude which runs in a curvilinear figure from Bhinleur, and has at some remote period, joined the salt formation westward of the Hydaspes, ere severed by that river. It runs nearly South from Russool to the distance of two miles, melting there into the plain; from which rises the isolated lofty mound of Moongb, a considerable village. During the monsoon, immediately below the cliff of Russool, rolls the Hydaspes; but farther South, Kanda land interposes, i. e. land subject to inundation, and utterly unfitted for the manœuvres of chariots or even of cavalry. The bed of the Hydaspes being here a shifting sand, it is impossible to conjecture what might have been its figure two thousand years ago, islands are constantly forming and disappearing. But the character of the cliffs and heights of Russool is so remarkable, that it could scarcely have escaped the minute detail of Arrian's description. Nor does it seem probable that such a master of strategie as Alexander, should have selected a landing place immediately below a cliff and height, where a hundred of the enemy could have set at defiance his whole array. Still less is it probable that with such a bird's eye view of the river as is afforded by the mountains on Alexander's side, that great captain could have mistaken an island for the shore. Moreover, the cliff at Russool is so lofty that the whole river lies beneath an eye stationed there. No island or series of islands on the further side could have masked Alexander's preparations from the scouts of Porus. On landing, he would have found himself beneath a cliff, crested with armed men. The great breadth of the river there, admits of a boat crossing but twice between day-break and night. To have landed fourteen thousand men, one-third cavalry, would have required an absolute fleet of boats and rafts.†

\* Kunka is granulated Tufa, deposited by rain water in soaking through alternate strata of marl and clay.

† Suppose that upon one raft of skins fifteen cavalry could be crossed. Then



These boats were conveyed on carts to the spot and hidden behind the island nearest shore. The rafts were hidden in the bushes. But they must have been launched at least a day or two previous to the embarkation in order to prove their capacity for the enterprize. This could not have been done at Darapoor, without giving the alarm at Russool.

We have yet to examine a circumstance which has led several to think the crossing must have been in this neighbourhood. Curtius has stated that in crossing the tremendous torrent of the Hydaspes, the waters, beaten back,\* betrayed the existence of hidden rocks: in many places, he adds, further on,† but *one* boat was wrecked, being driven by the current against a rock. Now although I think that Quintus Curtius's history is generally faithful; yet there are proofs sufficient that he occasionally dealt in poetical embellishment of facts. This is seen in his episode of Alexander and Charus at the storming of Aornos, and in the fine speeches which he puts into the mouths of his heroes. Any person gazing upon the torrent of the Hydaspes, during the monsoon or previously, must have been struck with the sight of these "*undæ repercussæ*," this boiling up of the waters, as if hurled back from sunken rocks. Nevertheless, there are no rocks below Luhri. There are none at Darapoor nor at Julalpoor, although the mountain almost dips its foot into the wave. The reason of this seems to be that the sandstone is so soft and friable, that it melts into sand under the influence of air and water. Arrian is quite silent about the rocks. The inference is that none existed then, any more than now. A boat may have been lost against the hard solid bank of the island, as well as if it had been rock. The current is so violent at that season, that a boat with fifty or sixty men in it, is easily smashed against any obstruction less soft than water. As the boiling

4500 cavalry would require 300 rafts. And if one boat would take 50 infantry, 190 boats would be required for 9500; giving a total of 490 floats. Where could they have been concealed from a scout on the high cliff of Russool.

\* *Nec pro spatio aquarum late stagnantium impetum coercebat; sed quasi in arctum coeuntibus ripis, torrens, et elisus ferebatur; occultaque saxa inesse ostendebant pluribus locis undæ repercussæ.*—Q. Cur. lib. viii. cap. 13.

† *Una ergo navi, quam petrae fluctus illiserat, hærente, cæteræ evadunt, id. lib. viii. cap. 13.* The word "*hærente*," here used, savors rather of a bank or shoal than of a mass of stone properly termed rock.



of the waters exactly imitates their action over sunken rocks; so would any of the solid banks near Bhoona represent the power of a rock to the hapless boat dashed against it. It must also be remembered, that at Bhoona, where I suppose the crossing to have been made, the bottom is a pavement of large boulders, firmly cemented together. Above this originally lay shingle of smaller sizes, to the depth of several feet, now carried away from the channel, but still appearing in the islands and often forming solid shoals, quite as dangerous as rocks. Occasionally masses of this shingle become disjected from the shore and form, for months, huge, rock-like cubes; until gradually their cement is dissolved by the elements. Thus, it will be seen that Curtius's expressions will apply better to the Hydaspes above Jelum, than to that river above Julalpoor. The "*insulæ crebræ*," if they ever existed at the latter spot, are no more to be seen. It is impossible for any one looking on the river there, with Arrian and Curtius before him, to imagine he contemplates the scene described by either.

Let us next refer to the landing. On accomplishing this, we have no mention of Alexander finding the corps of observation sent against him, posted on a height from which it was necessary to dislodge them. On the contrary he dashes\* at them with his cavalry. But at Russool the Kándá (or inundated land) will not admit of cavalry movements, and no cavalry can charge up cliffs and rugged ravines.† Porus, too, marched, *until* he found himself upon soil firm enough to admit of cavalry evolutions. This could not have been the Kandá; he must needs have been upon the sandy soil above it, in which case Alexander had so decidedly the advantage of ground that it is wonderful that Arrian has not noticed it. The chariots of Porus‡ according to Arrian, were encumbered in the mud; according to Curtius, they were

\* 'Ὡς δὲ κατέμαθεν ἀτρεκῶς τὸ πλῆθος τὸ τῶν Ἰνδῶν, ἐνταῦθα δὴ ὀξέως ἐπιπυσεῖν αὐτοῖς ξὺν τῇ ἄμφ' αὐτὸν ἵππῳ. Arrian lib. v. cap. 15.

† 'Ὡς δ' ἐνέτυχε χωρίῳ ἵνα οὐ πηλὸς αὐτῷ ἐφαίνετο, ἀλλ' ὑπὸ ψάμμου γὰρ ξύμπαν ἦν ἄπεδον καὶ στερεὸν ἐς τὰς ἐφόδους τε καὶ ἀναστροφὰς τῶν ἵππων, ἐνταῦθα ἔτασσε τὴν στρατιάν. id.

‡ Τὰ δὲ ἄρματα αὐτοῖς ἵπποις ἀλῶναι, ἔντε τῇ ἀποχωρήσει βαρὴα γενόμενα, καὶ ἐν αὐτῷ τῷ ἔργῳ ὑπὸ πηλοῦ ἀχρεῖα. id.

Gravesque et propemodum immobiles currus illuvie et voraginibus hærebant. . . . . Aliorum turbati equi non in voragines modo lacunasque, sed etiam in amnem præcipitavere curricula. Q. Cur. lib. viii. cap. 14.



swamped in quicksands. But, as already observed, the Kándá land could not have been the battle field ; no charioteer would have ventured upon it. And as for the high plain above the cliffs, the soil being sand, bound together by grass, becomes the firmer for saturation ; so that here again the features disagree. What, then is the evidence that Alexander crossed the Hydaspes at the Russool ferry? Mr. Williams's argument is that Strabo\* has said : The Macedonians marched to the Hydaspes from the Indus in a southern direction. But from the Indus, there is no carriage road south, nor is Julalpoor south of Atuk, though both Jelum and Julalpoor lie from thence very many degrees south of east.

Burnes says, " It has been conjectured that Julalpoor is the scene of Alexander's battle with Porus, &c. There is much to favor the opinion ; for, in the words of Curtius, we have islands in the stream, projecting banks and waters dilated, yet the mention of sunken rocks seems to point higher up the river, near the village Jelum. The high roads from the Indus pass this river at two places, at Julalpoor and at Jelum : but the *latter* is the great road from Tartary, and appears to have been the one followed by Alexander. The rocky nature of its banks and bed here assists us in identifying the localities of the route, since the course of the river is not liable to fluctuation. At Jelum the river is also divided into five or six channels, and fordable at all times excepting in the monsoon.

\* Since writing the above I have received a copy of Strabo. His words are 'Η μὲν οὖν μέχρι τοῦ Ὑδάσπου ὁδὸς τὸ πλεον ἦν ἐπὶ μεσημβρίαν ἢ δ' ἐνθένδε πρὸς τὴν μάλλον μέχρι τοῦ Ὑπάνιος· ἅπαντα δὲ τῆς ὑπερείας μάλλον ἢ τῶν πεδίων ἐχομένη. Strabo, lib. xv. p. 700, c. This has been somewhat inaccurately quoted by the author of the best popular Life of Alexander, in the Family Library, who says, " We are informed by Strabo that the Macedonians marched in a Southern direction from the bridge across the Indus to the Hydaspes. As there can be no doubt that the bridge was built in the vicinity of Attok, we may be almost certain that the advance of the army was along the main road from Attok to Jellickpore [Julalpoor, perhaps he means,] on the Hydaspes." Ch. xiii. par. 6. But Strabo, in this passage, says nothing of a bridge, and he qualifies the word *μεσημβρίαν* by the comparative *πλεον*. He adds, they passed rather over the roots of the mountains than through the plains. This is precisely a description of the route from Attok to Jelum. There is no carriage road from Attok, or the Indus near Attok, to the South. Nor is Julalpoor South of Attok, but both Jelum and Julalpoor lie South of East of Attok.



“About fifteen miles below Jelum, and about 1000 yards from the Hydaspes, near the modern village of Darapoor, we hit upon some extensive ruins called Oodeenuggur, which seem to have been a city that extended three or four miles. The traditions of the people are vague and unsatisfactory, for they referred us to the deluge and the time of the prophet Noah. Many copper coins are found, but those which were brought me bore Arabic inscriptions, &c. Genl. Court found a fluted pillar *near* this site, with a capital very like the Corinthian order. It however had a Hindu figure upon it. At present there are no buildings standing, but the ground is strewn with broken pieces of kiln-burnt bricks and pottery, the latter of a superior description. On the opposite side of the Hydaspes to Darapoor stands a mound said to be coeval with Oodeenuggur, where the village of Moongh is built, at which I procured two Sanskrit coins. There are also some extensive ruins beyond Moongh near Huria Badshapoor. I do not conceive it improbable that Oodeenuggur may represent the cite of Nicæa, and that the mounds and ruins on the Western bank mark the position of Bucephalia.”

So far Burnes. I did not hear of the ruin of Oodeenuggur when in the neighbourhood, or should have visited it. Burnes rates it at fifteen miles below Jelum. But Darapoor is nineteen and half miles, as the crow flies, or, by the road, about twenty-four miles. If therefore it be Nikaia or Boukephala, Alexander's camp must have been at Julalpoor, which Burnes had just before proved to be improbable. Alexander's flank movement according to Arrian was a hundred and fifty stadia or about eleven miles.

Again, the foregoing extract would lead any one to suppose Moongh opposite to Darapoor or Oodeenuggur. But Moongh is in fact seven miles below Darapoor. And the only argument Burnes could himself observe for the Grecian origin of either was, that Oodeenuggur yielded *Arabic* coins and inscriptions, and Moongh two *Sanskrit* coins. Genl. Court, however, found a fluted pillar with a Hindu figure in relief near Oodeenuggur. And therefore it is probable that it was inhabited previous to the extinction of the Scytho-Greek architecture which seems to have lasted till the invasion of Mahmood Ghuznavi. Oodeenuggur and Moongh, both very old Hindi names, are probably antecedent to Alexander's invasion, and give not the slightest hint of having succeeded to older Greek titles.



With regard to the resemblance which Burnes supposed between the Hydaspes at Julalpoor and Curtius's description, it seems to have arisen from Burnes trusting too much to memory. Curtius nowhere says that the Hydaspes opposite Alexander's camp showed "projecting banks and waters dilated." On the contrary he says, "*Nec pro spatio aquarum late stagnantium impetum coercebat; sed quasi in arctum coeuntibus ripis, torrens, et elisus ferebatur.*" "Nor did it curb its impetus on account of that spread of waters widely overflowing, but as if compressed by the rushing together of the banks, roaring and strangled it was hurried past." As to islands, Curtius says not that there were islands, but that the stream was thick sown with islands; which is certainly not the case near Darapoor or Julalpoor.

As for the site below Russool, called Gunja, it does not yield a brick or a building stone or a Greek coin to research. A space about five hundred yards in length by seventy wide is marked with fragments of pottery, and therefore in all probability has been a village site. But it is not in the slightest degree elevated above the soil, like all old sites in India, and the potsherds do not penetrate below a depth of two feet. A mud village may have been here, but could not have existed above one or at most three generations, or the accumulation of soil would be manifest. The Sikh trench of circumvallation made after the battle of Chillianwala has ploughed this site up throughout its length and exhibited its contents. The natives call it Gunja, or, the market: they have no tradition regarding it.

Why then, is this Nikaia? the city that was built to mark the greatest and most memorable of Alexander's exploits. Was Alexander,—the shrewdest king that ever played the paltry game of conquest,—was he the man to found a city which was to bear the memory of his greatest victory to remote ages, upon an obscure site, off the road of commerce, and not even opposite to a ford or ferry? in the certainty that it could never be more than a village and that neither traveller nor merchant would visit it? If the crossing was at Russool, then Nikaia is Moongh, and Julalpoor is Boukephala. A few words therefore may be devoted to each.

Moongh is a large village on the eastern bank of the Hydaspes, and about two miles from the stream. It is sited upon a very high mound, which appears to me partly natural, partly an accumulation of



rubbish. So far as I can learn, Greek bricks are not found there, and few, if any, Bactro-Greek coins. Tradition is silent regarding it. Julalpoor is a large modern village, built about sixty years ago by Rájá Jullal Khan, whose descendants still live in the neighbourhood. It stands upon a spur from the salt range. The original town stood upon the mountain at the distance of a mile from Julalpoor, in a very strong and rugged position. It was about a quarter of a mile in length by a hundred and fifty yards in breadth, built of undressed stone cemented with mud; in short, a collection of rude huts. It was called Girjauk, was inhabited by the Rajpootra tribe of Junnooi, and was attacked and destroyed seventy years ago by Sirdar Chirt Singh, grandfather of Runjeet Singh. I carefully explored the ruins without discovering a single stone bearing the marks of the chisel. No Greek or Bactro-Greek coins are found there. If therefore it be Boukephala all traces of the identity are lost. Yet it is very certain, that if Alexander crossed at Russool, this must have been Boukephala. He halted and celebrated the obsequies of the fallen opposite the crossing;\* but he of course built the cities where they would remain such, and not mere congregations of obscure huts.

It may be asked, might not Alexander have crossed the Hydaspes eleven miles below Julalpoor? Upon this question, I am not prepared to enter fully. I can hear of no circumstance to warrant the supposition. The river there is of great breadth, rather more than one and a half miles during the monsoon, and as we have no evidence of Greek sites either there or at Julalpoor and Moongh, I do not think it will be very readily advocated.

May not then the crossing have been eleven miles below Jelum? In this there is no impossibility: but we know not a single argument in favour of it. The river bed being there soft sand, it is impossible to calculate the aspect of the river two thousand years back, as every

\* "Ἰνα δὲ ἡ μάχη ξυνέβη, καὶ ἔνθεν ὀρμηθεὶς ἐπέρριψε τὸν Ὑδάσπην ποταμὸν, πόλεις ἐκτίσεν Ἀλέξανδρος καὶ τὴν μὲν, Νίκαιαν, τῆς νίκης τῆς κατ' Ἰνδῶν ἐπώνυμον ἀνόμασε τὴν δὲ, Βουκεφάλαν, ἐς τοῦ ἵππου Βουκεφάλου τὴν μνήμην, ὅς ἀπέθανεν αὐτοῦ, &c. Ἀλέξανδρος δὲ ἐπειδὴ οἱ ἀποθανόντες ἐν τῇ μάχῃ κεκόσμητο τῷ πρέποντι κόσμῳ, ὃ δὲ τοῖς θεοῖς τὰ νομιζόμενα ἐπινίκια ἔθουε, καὶ ἄγων ἐποιεῖτο αὐτῷ γυμνικὸς καὶ ἵππικὸς αὐτοῦ ἐπὶ τῇ ὁχθῇ τοῦ Ὑδάσπου, Ἰνα περ τὸ πρῶτον διέβη ἅμα τῷ στρατῷ. Arrian v. 19 and 20.



year alters it. Koharr is an old site, but I could there procure neither Greek coins nor any intelligence of sculpture or of Greek bricks being turned up. There is one large inhabited island opposite Koharr, but it seems to me of recent formation, and to have been, not a hundred years ago, one with the shore. Supposing it to have been divided from Koharr by a small creek, it would answer very well for the second or larger island encountered by Alexander. The "*insulæ crebræ*," however, if they existed here, are no longer found. It seems to me, that Alexander having the choice of flanks to move upon, could not have hesitated for a moment to prefer making his passage to the left: for there, between him and the opposite shore, intervened extensive and well wooded islands; and the deep narrow channels between them afforded a mask to his fleet, so that its increase or diminution could not be perceived by the enemy. Moreover, by reference to the map in the No. of this Journal for December, 1848, it will be seen, that in order to oppose Alexander by that passage, Porus had to march nineteen miles. Whereas by this passage he would have marched but ten miles. The figure of the river and its islands to the north of Jelum agrees exactly with Arrian's and Curtius's description. Here are the inhabited and uninhabited,\* the wooded and the naked islands in which the youth of either force met to skirmish. There is the promontory (Bhoona), round which the current circles in a remarkable manner, and from which to this day cattle take their plunge to reach the small jungle-clad island in mid-stream: the set of the current from thence being directly on that island. There is the larger island five and half miles in length and uninhabited, with its invisible eastern channel, fordable even during the monsoon, having a firm pavement of stones. Here is the firm plain beyond the river, hard and solid

\* "Ἀκρα ἦν ἀνέχορσα τῆς ὕχθης τοῦ Ὑδάσπου, ἵνα ἐπέκαμπεν ὁ ποταμὸς λόγου ἀξίως· αὐτὴ τε δασεῖα παντοίων δένδρων εἶδει, καὶ κατ' αὐτὴν ρῆσος ἐν τῷ ποταμῷ ὁλώδης τε καὶ ἀστιβῆς ὑπ' ἐρημίας. Arrian, lib. v. cap. 11.

Erant in medio amne insulæ crebræ, in quas Indi et Macedones nantes, levatis super capita armis, transibant. . . . . Erat insula in flumine amplior cæteris, silvestris eadem, et tegendis insidiis apta. Q. Cur. lib. viii. cap. 13. We have only to read on to feel assured of Curtius's ignorance of military strategie, for he evidently supposes that Alexander drew the attention of Porus to the island by which he meant to effect his passage, and that the passage was effected in front of both camps.



after rain, where not ploughed; but obstructing, where ploughed, the motion of the chariots. There, in rear of Porus, are the quicksands in the wide shallow bed of the Sookaytur, in which, according to Curtius, the chariots were swamped: and here is a river of moderate breadth, which Alexander's entire force might have crossed in the course of eight hours: and, in the curvature of the river, there favourable to Alexander but otherwise to Porus, we see how Alexander's fear of finding the phalanx of elephants of Porus arrayed upon the hostile bank to oppose his cavalry, was disappointed.

But is it objected that the constant wear of a river's banks, must in the course of 2200 years have obliterated all traces of its previous configuration? I answer, that I have well considered this question: that I have carefully compared my own observation of alterations in the banks with the yearly alterations described by the inhabitants of that portion of the Hydaspes.

But in order to do justice to this question it is necessary to go back to remote ages, when the Hydaspes or the Kishengunga first escaped from the mountain-walled basin which held its waters as a tranquil lake.\*

Imagine, then, an immense inland sea occupying the entire valley of Cashmere up to the roots of the mountains around. Imagine some unusual planetary conjunction drawing together the clouds in one of those deluges of rain, of which we have an instance in the Flood of Moray. The waters of the sea of Cashmere† are elevated far above their ancient level, until they actually begin to overflow in the lowest of the passes—the Buramoola. The instant the smallest runnel has found an escape, the sea puts forth its whole strength upon that point. Every moment, every hour, the channel is enlarged, the torrent is aggrandized. The mountain is cleft from shoulder to base as by the axe of a Titan, and through the narrow sky-walled rift formed by the meeting of precipitous mountains, there pours a deluge, compared with which Niagara were an infant. This deluge holds on its course till again impeded by a mountain barrier. Behind this, it rapidly

\* All mountain rivers that I have examined afford evidence of having been originally lakes. The Indus which cleaves a snowy barrier, N. East of Chilas—the Jelum—the Ravi—and, probably, the Sutlej.

† This escape of the sea of Cashmere is recorded by tradition.



accumulates its forces : but the instant a runnel has surmounted the pass, the whole is again in motion, urging all its might upon the point ; cleaving, melting, rending, overthrowing, until once again the tremendous chaos of water, forest, mud, and the bodies of men and beasts, is hurled forward with portentous impetus, through the narrow gorge upon the deep soil of the yet scarcely furrowed valley. So long as the course of this torrent lies between mountains, the walls of living rock prevent its spread and hold it to the depth perhaps of three or four hundred feet. But as it issues forth upon the nearly level valley with astonishing velocity it spreads out on either side, widening as it goes, licking up the clay and finer particles of sand, to hurry them with its waters to the ocean. Thus is abraded all the superficial soil to the depth perhaps of two hundred feet, and thus is formed the river basin, properly so called, to the breadth at Koharr of three or four miles. But now the reservoir of waters is somewhat exhausted. The supply is reduced to the daily tribute paid to the Hydaspes by the mountain spring. The course of the river between the mountains is that of a deep and rapid mountain stream but as it emerges into the basin recently delved for it in the open valley where the differences of level are not very abrupt ; the velocity of its waters causes their deflection into many separate currents, as grape-shot spreads on losing the constraint of the gun : or as a stream of water poured from a height is split into rain ere it reach the earth, by the opposition of the atmospheric medium. And thus are formed many islands ; some at once, before the channel has been worn very deep, others subsequently, when the surface of the channel has been still further abraded. The former are on a level with the river banks on either side : have deep firm clay soil and a stratification corresponding with that of the banks ; they bear crops, have often villages, and are easily mistaken for the further bank of the river. The latter are much lower than the river banks, and emerge only because the channels have sunk around them. They have been wholly despoiled of their clay soil and only shingle and sand remain to them : the latter sometimes original, sometimes the deposit of inundations. These islands often bear the tamarisk : but as they are more or less subject to inundation, permanent houses are not erected there. As the river proceeds, it receives the tribute of the plains ; it finds a basin growing more and



more level, a depth of soil, which cannot be fathomed, it spreads out into a wide sheet of water forming islands, indeed, but islands which almost as soon as they are formed begin to melt away in the set of the yearly inundation, which, having no rocks nor channels of shingle to determine its current, takes a different course every year, shifting\* from side to side of the extensive basin. The action of the wind upon so wide a surface of fine sand, aids this caprice of the current. The waters find their channel of last year obstructed by sand, and put forth their strength in a new direction washing away the islands of last year and depositing sand-banks, which every year rise by the deposit of silt until they become islands: but which are always subject to overflow or even dissolution in heavy floods. Sometimes indeed when the river comes down with unwonted power and finds the old channels obstructed or grown very devious, it sweeps onward over the country and receives an entirely new channel in a directer line, isolating a portion of the country so large that it continues to be an island for centuries and is inhabited and cultivated. Such islands however are rare in the Hydaspes below Jelum. I know of only two or three. They may, when very extensive, be mistaken for the opposite bank of the river by a person who cannot command a bird's eye view of the stream. But the other kind never can be thus mistaken.

Let us once more return to the river channels on the escape of the Hydaspes from the mountains. These every year sink in depth, until they have cut through the strata of finer shingle and penetrated to the pavement of massive and firmly cemented boulders which no ordinary torrent can move. There the furrowing action of the current is arrested, and the figure of the channels is preserved, by the solidity of the scarps, and the only change that can ordinarily happen to them in the lapse of ages is the gradual and yearly wear of the banks at the salient curvatures, and the consequent decrease in the depth of the stream. If indeed such a terrible inundation as that which occurred to the Indus about twelve years ago should happen to the Hydaspes, the soil of the higher islands would of course be swept away and they would become like the secondary islands, shoals of shingle, strewed with sand, and remain so for ever; there being at

\* In the river Sardah I have known these aberrations amount to eight miles or more.



this place almost no deposit of clay from the waters of the Hydaspes. But that such a prodigy has never happened to the Hydaspes since first these islands were formed is sufficiently manifested by their strata.

The Hydaspes has been deflected from the natural level of the country which fall from N. E. to S. West at right angles with the Pir Punjab, by the thrust of the rock south of Mungla; which has turned it somewhat uphill toward the east. Of course the aggregate efforts of the river for centuries will be to find the natural level of its stony pavement, to enlarge its Western channel by wearing the right bank of that channel and to abandon gradually the Eastern channel. Therefore to calculate the effect upon the channels of the Hydaspes of 2200 years of these efforts, let us take a single year and suppose that in that period, the banks are wasted in twenty-four places, to an average depth of four yards and an aggregate length of 600 yards: in the space intervening between Mungla and Jelum equal to twenty-four miles. In the course of 2200 years this wastage dispersed over that extent of channel will have increased its average breadth of 800 yards to 813 yards. So that supposing no deluge to have happened to the Hydaspes in that period, the channel will be now thirteen yards wider than at the passage of Alexander. It is certain that were the wear three or four times as great as here assumed, it would not materially alter the features of the river.

We have yet to examine the old sites upon the Hydaspes at and opposite the modern town of Jelum, which I suppose to be Boukephala and, though less certainly, Nikaia. The first evidence Alexander gave of his great and dominant energy and of his practical judgment was in taming the wild horse Boukephalas.\* It became an important part of his history and all his great deeds were performed from the back of Boukephalas. Can it be wondered that the death of his old and tried companion should powerfully affect Alexander, who though the wisest and most politic of all conquerors, was impelled not by the love of acquisition, but the thirst of renown, imbibed by him in his

\* Βουκεφάλας, ὃς ἀπέθανεν αὐτοῦ, οὐ βληθεὶς πρὸς οὐδένος, ἀλλ' ὑπὸ καύματος τε καὶ ἡλικίας· ἦν γὰρ ἀμφὶ τὰ τριάκοντα ἔτη, καματηρὸς γενόμενος, πολλὰ δὲ πρόσθεν ξυγκαμῶν τε καὶ συγκινδυνεύσας Ἀλεξάνδρῳ, ἀναβαινόμενός τε πρὸς μόνου Ἀλεξάνδρου ὁ Βουκεφάλας οὗτος, ὅτι τοὺς ἄλλους πάντας ἀπηξίου ἀμβάτας, καὶ μεγέθει μέγας, καὶ τῷ θυμῷ γενναῖος. Arrian, v. 19.



study of Homer. Even to this day there is no circumstance connected with the history of Alexander which so powerfully affects the imagination and interests the affections, as this bond of sympathy between the conqueror and the steed which would yield to none but him. A city was built to mark the neighbourhood in which his horse had died. That city marked also the zenith of Alexander's fortunes. From that point all is downhill in his career. Toil encountered without motive and without reward. A rebellious army: vast tracts won, *but* to be lost. Deserts traversed, too miserable to be retained. Hunger and thirst endured, blood spilt and wounds received in petty conflicts which added nothing to the lustre of his renown: and finally his untimely death, at feud with his Macedonians, and far away from his native land.

The first cities of Boukephala and Nikaia\* had been injured by the rain. The Rev. J. Williams, author of a life of Alexander, says, that the injury was received from the rise of the Hydaspes, but does not state his authority. He may not be aware that a heavy fall of rain will wholly dissolve a new Indian city built of clay or not unfrequently of marl. The present Jelum however, is occasionally flooded and injured by the rise of the Hydaspes. About 400 yards from the river's brink, and due West of the present Jelum, is an elevated mound about as extensive as the present town, but running East and West. It is wholly composed of the rubbish of decayed or ruined buildings and Jelum has been built of the old Grecian bricks dug from this site. It is also full of Greek and Bactro-Greek coins. General Ventura ran some shafts into it and dug out an architrave of free-stone, of Grecian sculpture, of which a sketch was sent to this Journal. Another and very beautiful fragment of the same ruin, (a temple, perhaps, to Ceres,) is to be seen at Kálá, a small town about three miles from Jelum. It is a sculptured free-stone column of what I have termed the Indo-Ionic order.† I also dug up one or two

\* Καὶ τὸν Ἀλεξάνδρῳ διαβὰς, ἐπὶ τὸν Ὑδάσπην ἦκεν, ἵνα καὶ τῶν πόλεων, τῆς τε Νικαίας καὶ τῶν Βουκεφάλων, ὅσα πρὸς τῶν ὄμβρων πεπονηκότα ἦν, ξὺν τῇ στρατιᾷ ἐπεσκεύασε. v. 29.

Neither Curtius, nor Strabo, nor Pliny, nor Plutarch gives any hint of the injury having been received from the river.

† See the No. of this work for February, 1849.



fragments of sculptured stone from the same spot, and sent them to Lahore in progress to the Asiatic Society's Museum. This seems to have been the Boukephala of history. Nothing is known of its name or fortunes by the natives of the country, excepting that it is not the old Jelum. They call it, in common with a hundred other sites of which the name is lost, Pindi, or the town.

The old site on the eastern bank of the Hydaspes is far less elevated than that just described. The artificial accumulation of soil is not above twelve or thirteen feet. It is called old Jelum and that is undoubtedly the name it bore previous to its destruction; as the lands belonging to the site, bear that name, as does the modern village erected there. I found many shafts (now filled up) which Genl. Ventura sank some years ago. The inhabitants say, he found a few large, i. e. Greek, bricks, some smaller bricks, and a few pice. I also sunk a shaft and found, first, earth and potter's clay, then a few small bricks, which seem to have been introduced by the Muhammedans; and then one or two larger bricks. The coins brought me were few, and generally either Hindu or of the later Bactro-Greek dynasties. It stands close to the easternmost small channel of the Hydaspes, on a low plain, or rather valley, and must, I think, have been liable to occasional injury from floods. Its length is about 400 yards and breadth about 100. It would appear to me to have been originally a Greek town, and subsequently Hindu or Muhammedan, but not to have existed so long as Boukephala and to have had no great importance as a Greek town.

Supposing it to be the Nikaia sought, reasons for this are easily found. The Greek empire every now and then extended itself beyond the Hydaspes. But that river was generally its utmost Eastern limit: by the great scarcity of Greek coins Eastward of the Hydaspes, and their great abundance Westward. Moreover upon a road of no very considerable commerce, it required the direct interference of a despotic government to maintain the prosperity of two considerable towns, in such close contact. The site of Boukephala being higher, drier, healthier, and nearer the ferry than that of Nikaia, the latter would gradually languish; the more especially as Greek subjects would feel more secure on the Western side of the Hydaspes.

I think it probable that Boukephala existed at least to the invasion



of Mahmood of Ghuzni, and was then, with hundreds of other towns, overthrown; and its name (which must have sounded idolatrous to that righteous monster) blotted out. The existence in it of an idol temple (the temple before alluded to) would have sufficed to seal its condemnation.

But the site is too important to be many years neglected, and hence the town of Jelum may have arisen on the site of Nikaia, and this being afterwards destroyed or found inconvenient by the inhabitants, may have led to the erection of the modern town of that name close to the site and built of the bricks of the ruined Boukephala. This town, whatever its origin, has changed the name of the Hydaspes from V'dusta to Jelum; and it may be a question whether it be, as generally supposed, a Persian word, or a corruption of the Greek word *ζῆλον* pomp, or *σῦλον* spoils—the place where the booty of Porus was divided.

But for the existence of an old Greek site at old Jelum, I should have supposed that Nikaia had been where Sookchynepoor now stands, and that it was one town of several which have there been destroyed by the encroachments of the Hydaspes. But there is no tradition of the name of the towns thus carried away, which can aid in throwing light upon the question. The site of Sookchynepoor is peculiarly happy, and must have been I think almost upon the battle-field, or at least in sight of it. If Sookchynepoor be Nikaia, the old Jelum is probably a Greek town with a Grecian name.

If then my arguments have not been in vain, I have shown—

1st. That Alexander must have skirted the mountains of Huzara, the realm of Abisares, after his passage of the Indus.

2nd. That the probabilities are in favour of his having followed the Jelum route to the Hydaspes.

The word Jylum is derivable from Sunscrit: viz. Jy, victory—lim, house,—the habitation or abode of victory; which is just a translation of the Greek name Nikaia. The position of Sookchynepoor as the site of Nikaia is for many reasons preferable to that of old Jelum. But unfortunately there is no tradition that can assist us in fixing it with certainty, and the site of the town which preceded Sookchynepoor has been wholly swept away by the river.

3rd. That the probabilities are strongly in favour of his flank



movement to cross the Hydaspes having been to the left rather than to the right.

4th. That the features of the ground and of the river eleven miles above Julalpoor do in no wise agree with Arrian's minute description.

5th. That the features of the ground and of the river eleven miles above the Jelum ferry tally with Arrian's and Curtius's descriptions in every particular: for which compare the accounts of those authors with my map of the Hydaspes in the number of this Journal for Dec. 1848.

6th. That the site of Nikaia in Arrowsmith's map of 1849 is laid down upon insufficient authority, and has never been the site of a city, nor could ever have been selected as such by Alexander.

7th. That we must look for traces of Nikaia and Boukephala upon the main road or near some important ferry: not in obscure corners, where they could have had no existence as cities, or where, if existent, they must have been unknown.

Is it a mere flight of fancy, or do I really trace this Anabasis in the names of the villages which mark the course of the invader? The question is curious, and if the reader will refer to the map of the Jelum so often quoted, he may in five minutes be, if not edified, at least amused.

I have in that map placed the camp of Alexander opposite the present Jelum. But as Alexander could not at that time use the ferry, it is not improbable that his camp may have been higher up the stream where the islands commence. Quintus Curtius speaks of skirmishes going on in the islands of the Hydaspes, and it is obvious, that a camp at Khokur would have facilitated the flank movement purposed, by enabling the Macedonians to screen their boats in the deep western channel, and behind the high islands of the Hydaspes. This, therefore, seems the more probable locality, and if so, the village Koolal may be derived from the Greek *κωλύω*, to impede, (the place of impediment).\*

Ten miles above this is the promontory which appears to me *that* mentioned by Arrian as the point of embarkation. There, on the

\* Ἀπέχει δὲ ἢ τε ἄκρα καὶ ἡ νῆσος τοῦ μεγάλου στρατοπέδου ἐς πεντήκοντα καὶ ἑκατὸν σταδίου. Arrian, v. 11.



highest ground of the western bank, stands the old village Boonna, quasi βωμός, the altars, where women are ever on the watch to greet Sirdars with ἐπινίκια, or triumphal songs. Higher up, and little more than eleven miles from the grand camp, upon the high bank of the river basin, is the village Ahra, quasi ἀρά, prayer: in this case addressed probably to the river gods or to Apollo, to whom he sacrificed\* after the victory. Here let us pause. The river channel under Ahra is recent and may not then have existed; in which case, the island of Chunnee, and perhaps the small island beyond it, formed part of the Western bank; the latter being the point of embarkation. Right in front of this is a small angular island, and immediately beyond that is a narrow island of great length, which may then have joined that of like shape to the right and have been the larger island mistaken for the Western bank. In this case, the landing would have been above the village Dubb, and the battle probably near Gusseetpoor (quære from γαίω, to exult?) But however that be, we have the village Seem (quasi σῆμα, the sepulchre). Sirwál from σῦρω, to sweep away. Roopa (quasi ῥοπή, the turn of the scales). Tutrót (incorrectly printed Tutrola) from τιτράω, to wound, (the place of wounding, or the deposit of the wounded after battle, or the spot where, according to Curtius, Porus sank wounded). And finally we have the Hindi town Sookchynepoor (built upon the site of a town whose name is lost) the place of comfort and enjoyment where the army refreshed after the battle, celebrating the obsequies of the slain with chariot races and gymnasia.

The whole of the tract from Mungla to Sookchynepoor is so lovely, so bright, so attractive, that it may be considered the paradise of the Greek possessions in the Punjaub; and as connected with the greatest of Alexander's and of their own exploits, would assuredly have been classic ground in their ages. Accordingly a large number of the villages have names derivable from Greek roots; as for instance, Luhree, from λαρός, sweet, delicious. Ihma, from αἷμα, blood; Sumwál (opposite the battle field, the old capital of the taloquh) from συμβάλλω

\* Alexander tam memorabili victoriâ lætus, quâ sibi orientis fines apertos esse censebat, soli victimis cæsis, &c. Q. Cur. ix. 1.

It is curious that Ara signifies in the language of the country, a stone platform, or altar.



to encounter. Hahl, from αῦλή, a sheepcote. Mootial, from μωτόω, to dress wounds. Munda, from μύνδος, silent. Wuddala, on the river's brink, from ὕδαλέα watery. Pundôr and Pundora, quasi πανδώρα, (richly endowed,) so named perhaps from some Grecian woman. Boorial (North of the river), from βόρειος, Northern. Bersâti from βύρσα, a hide, or skin for rafts. All Alexander's cavalry were wafted over upon such rafts. Kokur, from κωκύω, to lament. Even Nokodur upon the Western brink of the river basin, may be a corruption of Νίκαία, though not, I think, the Nakaia we are seeking, which ought to be upon the Eastern bank.

It is very true that all these have Hindi terminals, and that many are Hindi or Persian words. But, on the other hand, what has become of the names of the towns and villages founded by the Greeks in this country during a period of a thousand years. We find in the old sites, their coins, their sculptures, their years, covering that period of their dominion; but only in a single instance\* have I met with a Greek name unchanged. Even Alexander's capital in Huzara is Sikundurpoor, which is a translation of Alexandria. We all know the obstinacy of Hindus in modifying the names of persons and places to suit their own palate. There is no reason why a Hindu should not pronounce Aluksundur. But he will not. He translates it inevitably into Sikundur. The Greeks born in the country and using the Hindi tongue much more generally than their own Greek, would find it more convenient to accommodate themselves to the ear of the people of the country, than to insist upon their own pronunciation of Greek names.

In comparing together the two great battles fought upon the Jelum, we are struck with certain resemblances. Porus had, according to Arrian, 30,000 foot, 4,000 horse, chariots 300, and 200 elephants. Alexander had wafted over in time for the action, about 14,000 men in all; on foot 6,000, horse 5,000, archers and slingers 3000. Now Sher Singh at Chillianwala, not having been joined by the Peshawur

\* This instance is curious and to the purpose. It occurs in an obscure corner of the basin of the Indus, far up amongst the independent Pathans—i. e. about fifty miles above Umb. I stumbled upon it in tracing the course of the Chinese traveller Hiangh Tsang—a remarkable rock is there called Tahitta Butt Kephale Boas, to this day. It is, I fancy, a mass of white quartz. There was a village in that spot, but it was destroyed by the cataclysm of the Indus.



and Huzara forces, had probably about 18,000 regular troops, 20,000 irregulars, and about 55 guns; and Lord Gough had in all 14,000 men under arms. In both cases also the battle was fought on the eastern bank, the Sikhs insanely throwing away the formidable advantage which the high western banks of the very dangerous river Hydaspes would have afforded them. In both cases the victory was for the stranger, and the child of the soil was subdued. Notwithstanding all the errors marking the modern sanguinary and indecisive battle, the Sikhs were, to my certain knowledge, so beaten, that they had no thought of farther resistance, and if followed up next day by half our army would have been driven pellmell into the river. But the subsequent pause; the deplorable abuse of a free press in exposing to an enemy all our weaknesses and fears, very speedily converted the beaten sheep into a plucky lion. Nearly the whole of the Sikh horse had disappeared. Many were drowned in the panic attempt to ford the Hydaspes at Miani. With exception of Soorut Singh, there was in the Sikh army but one thought, and that was how they might shun further encounter.

But here the parallel ceases. And let him who would emulate in a better cause deeds that live fresh in memory after the lapse of two thousand years, study the masterly manœuvre of Alexander, the sagacity which conceived, the patient toil which matured, the consummate skill and courage which completed the operation. Above all let him see what distinguished Alexander from other conquerors and secured to his successors for many centuries the dominion of the world. Many have united to Alexander's courage, a skill little inferior to his, and have led troops equally hardy and equally disciplined to the conquest of foreign realms. But how few have united to those soldierly attributes, the princely generosity, the simple manners, the hardy habits, the good faith, the handsome sentiments of others, the truly gentlemanly spirit of the hero, which distinguished Alexander beyond almost every character of history, attached to him his soldiers, won the hearts of his enemies, and needed but more perfect light to have made him a model for the human race.\*

\* No excuse is here offered for Alexander's faults or crimes. But we must remember that occasional intemperance was inculcated by his religion as a sacrifice to Bacchus, and that ambition formed the highest obligation in the code of pagan virtue.



Of the course of Alexander after the victory on the Hydaspes, the following notes are offered as aid to those whose position near the scene may enable them to prosecute the enquiry. Curtius altogether omits notice of the Akesines or Chenáb. Arrian truly describes it as being more than a mile wide during the mousoon. But he adds,\* the great danger to the boats was from the power of the current, and the huge stones hurled down thereby.

In the present day, and at the ferries ordinarily used by armies in their passage to Lahore and Umritsir, the Chenáb is a less rapid river than the Hydaspes, and far less dangerous; being spread over an immense surface of the finest sand. In order to find shingle we must ascend above the junction of the river Tâhi of Jumboo, with the Chenáb, and in order to find large shingle and a torrent capable of hurling it along, we must ascend to the Kana ke Chuk ferry, four miles below Aknoor, where indeed the torrent is fearful and the boulders are of massive size.

But it must be borne in mind, that the river Akesines is liable at this point to considerable fluctuations of course. The slope of the earth is South West, but the direct line of issue of the river from the mountains is due South, and there can be little doubt that if ever this river has been a mountain lake, on its escape from the mountains, its main stream rushed down southward, whilst its inferior currents followed the natural level and streamed past Hummeerpoor, about eighteen miles further west. But ages of tranquillity enabled the main stream to pursue the natural level of the country, and, seventy years ago, the Akesines rolled past Hummeerpoor. Then came a memorable drought and famine, and at its close the river came down in a flood of such power as to bear onward in the direct course southward as far as Thoob; a course which it retains to this day, although the old channel (a considerable river) still runs under Hummeerpoor.

\* Εἶναι γὰρ ἵνα ἐπέρασεν Ἀλέξανδρος αὐτὸν ἐπὶ τῶν πλοίων τε καὶ τῶν διφθερῶν ξὺν τῇ στρατιᾷ, τὸ μὲν ρεῦμα ὁξὺ τοῦ Ἀκισίνου, πέτραις μεγάλαις καὶ ὀξείαις, καθ' ὧν φερόμενον βία τὸ ὕδωρ κυμαίνεσθαι τε καὶ καχλάζειν· τὸ δὲ εὖρος σταδίου ἐπέχειν πεντεκαίδεκα. Καὶ τοῖς μὲν δὴ ἐπὶ τῶν διφθερῶν περῶσιν εὐμαρῇ γενέσθαι τὸν πόρον· τοὺς δ' ἐν τοῖς πλοίοις διαβαίνοντας, ἐποκειλάντων πολλῶν πλοίων ἐπὶ ταῖς πέτραις καὶ ξυναβραχθέντων, οὐκ ὀλίγους αὐτοῦ ἐν τῷ ὕδατι διαφθαρῆναι. Arrian, lib. v. cap. 20.



The question then is, which of these courses was pursued by the Akesines when Alexander crossed it. Now, I doubt whether the current of the river, when it flowed beneath Hummeerpoor, would have sufficed for the effects attributed to it by Arrian. The declivity is not sufficient nor are the boulders there of a size to be dangerous to boats. I therefore incline to think the Akesines held its present course; and we have next to see what motives could have induced Alexander to deviate from the direct line of advance toward India and to have neglected the ferries at Wuzeerabad, Rám-nugur and Pool.

Alexander, after his conquest of the Jetch Doaba (the land between the Jelum and Chenab) found in his front the river Akesines, more than a mile in breadth, and swollen by the rains and melted snow. On the farther bank lay the army of Porus the 2nd, ready to oppose him. And that prince had probably secured or destroyed all the boats lying within his reach, as we know the first Porus to have done at the Hydaspes. Alexander had tried the valor of the Rajpootres, and had found them the most formidable of the tribes of Asia. On the other hand, Abisares, the king of the mountains in whose skirt he was encamped, had placed his kingdom\* at his disposal; and the brother of Abisares was in Alexander's camp as a hostage for the good faith of Abisares. It was obviously Alexander's sane policy to cross the Akesines within the territory of Abisares, which must have extended at least to Thoob, and probably southward of that taloquh, as at this day. My impression therefore is, that Alexander crossed the river at the Kana ke Chuk ferry, where the Akesines is precisely as described by Arrian, a torrent hurling along in its course large rocks dangerous to navigators. If this surmise be correct, Alexander's course would have been through Runjeet Gurh upon Sialkote, the ancient capital of the Powars,† in order to route the forces of Porus the 2nd. This prince having shown the white feather, Alexander sent a force in pursuit of him, and continued his own course, guided no doubt by the importance of the towns ahead, or of the

\* 'Εν τούτῳ δὲ παρά τε 'Αβισάρου πρέσβεις ἦκον, ἐνδιδόντες αὐτόν τε 'Αλεξάνδρῳ 'Αβισάρην καὶ τὴν χώραν ὅσης ἤρχε· &c. καὶ τὸν ἀδελφὸν τὸν αὐτοῦ ξὺν τοῖς ἄλλοις πρέσβεσι παρ' Ἀλέξανδρον ἐπεμψε. Arrian, v. 20.

† The name Porus is manifestly derived from Pooroowar now corrupted into Powarr. The Pooroowars were Rajas of Sealkote.



power of the forces prepared to defend them. It seems however manifest from Arrian's\* account that he invariably completed the conquest of the greater part of the Doaba invaded, ere he crossed the river into another Doaba. This was sound policy. But this circumstance renders it extremely difficult, in the probable change of the few names of towns mentioned by his historians, to trace his course to the river at which it terminated.

Curtius's description† of the beautiful Jetch Doaba is most graphic and most faithful, and may encourage us to trust his account of the tribes with whom Alexander came in contact. The rhinoceros, indeed, has long since vanished with the forests which sheltered him, but I disinterred, at Russool on the Hydaspes, the bones of the wild elephant in considerable number.

Arrian, after mentioning that Alexander in pursuit of Porus 2nd came to and crossed the river Hyphasis, and found it as broad as the Akesines, but with a far slower current ; (an argument for his having crossed the Akesines near the mountains, and the Hyphasis far from them, the Chenáb being at equal distances nearly double the size of the Ravi,) says, that Alexander passed through all the country border-

\* Προχωροῦντι δὲ αὐτῷ ἐπέκεινα τῆς ὀχθῆς τοῦ Ὑδραῶτου τοὺς μὲν πολλοὺς καθ' ὁμολογίαν προσχωρεῖν ξυνέβαινεν v. 21—and again, after destroying Sangala. Τὴν χώραν δὲ, τῶν Ἰνδῶν τοῖς πάλαι μὲν αὐτονόμοις, τότε δὲ ἐκουσίως προσχωρήσασι προσέθηκε· καὶ Πῶρον μὲν ξὺν τῇ δυνάμει τῇ ἀμφ' αὐτὸν ἐκπέμπει ἐπὶ τὰς πόλεις αἱ προσκεχωρήκεσαν φρουρὰς εἰσάγοντα εἰς αὐτάς· αὐτὸς δὲ ξὺν τῇ στρατιᾷ ἐπὶ τὸν Ὑφασιν ποταμὸν προὔχῳρει, ὥς καὶ τοὺς ἐπέκεινα Ἰνδοῦς καταστρέψαιτο. Arrian, lib. v. cap. 24.

† Multa materia navalis in proximis montibus erat, quam cedere aggressi magnitudinis inusitatæ reperere serpentes. Rhinocerotes quoque, rarum alibi animal, in iisdem montibus erant. Cæterum hoc nomen belluis eis inditum a Græcis : sermonis ejus ignari aliud linguâ suâ usurpant. &c. Silvæ erant prope in immensum spatium diffusæ, procerisque et in eximiam altitudinem editis arboribus umbrosæ. Plerique rami instar ingentium stipitum flexi in humum, rursus, quæ se curvaverant, erigebantur adeo, ut species esset non rami resurgentis, sed arboris ex sua radice generatæ. Coeli temperies salubris : quippe et vim solis umbræ levant, et aquæ largæ manant e fontibus. Cæterum hîc quoque serpentium magna vis erat, squamis fulgorem auri reddentibus. Virus haud ullum magis noxium est : quippe morsum præsens mors sequebatur, donec ab incolis remedium oblatum est. Q. Curtius, lib. ix. cap. 1.



ing the Hyphasis, i. e. on the southern border of the Ravi, and came (in progress to Σάγγαλα,) first to the town Πίμπραμα upon the Hydraotis, where the Ἀδραϊσταί, an Indian tribe, submitted. There halting one day, he came on the third to Σάγγαλα, where the Καθαῖοι, a warlike and very powerful tribe, were ready to defend their city with a formidable army. This city was moated on one side with a marsh, it had walls, and on the dry side a triple row of waggons\* linked together formed a triple rampart around a mound from which the enemy launched their arrows and darts. This town appears to have cost Alexander much trouble. The enemy's loss is recorded by Curtius at 8000, by Arrian at 17000. The city therefore must have been very large. It may have been on the Ravi, or one march from it. It was destroyed by Alexander. There was a mound on one side, which was probably the brick kiln from which the city was constructed. The swamp which half girdled it† may have been either a natural marsh, or an old channel of the Ravi, or the hollow, so common near Indian cities, caused by excavating the soil for the manufacture of bricks. This is frequently found in the form of a ditch; economy causing the people to dig at the points nearest to the site of the proposed building, and the great value of land near a town restricting the excavations to a certain surface. Supposing the palus to have been a natural marsh, its product the Singhara‡ nut may have given the town the name Singhara, which the Greeks would easily write Sângala. The Kathaioi had been at war with the Oxydrakoi and Malloi, so that Lahore, or a

\* ἵνα οἱ Καθαῖοι τε καὶ οἱ ἄλλοι πρόσχωροι αὐτοῖς ξυνεληλυθότες πρὸ τῆς πόλεως παρατεταγμένοι ἦσαν ἐπὶ γηλόφου οὐ πάντη ἀποτόμου· κύκλῳ δὲ τοῦ γηλόφου ἀμάξας περιστήσαντες, ἐντὸς αὐτῶν ἱστροποῖδενον, ὥς τριπλοῦν χάρακα προβεβληῖσθαι τῶν ἀμαξῶν. Arrian, v. 22.

† Ἐπὶ πολὺ γὰρ ἐπέχον τὸ τεῖχος τῇ στρατοπέδῳ κυκλώσασθαι οὐ δυνατόν ἐγένετο· κατὰ δὲ τὰ διαλείποντα αὐτοῦ, ἵνα καὶ λίμνη οὐ μακρὰν τοῦ τεύχους ἦν. Arrian v. 23.

Ad magnam deinde (ut in ea regione) urbem pervenit, non muro solum, sed etiam palude munitam. Cæterum barbari vehiculis inter se junctis dimicaturi occurrerunt. Aliis tela, aliis hastæ, aliis secures erant: transiliebantque in vehicula strenuo saltu quum succurrere laborantibus suis vellent. Curtius ix. 1.

‡ In India and in Cashmere the Singhara nut forms an important article of food, and in Cashmere yields a revenue to Government. It grows at the bottom of marshes. The kernel, which when roasted resembles the chestnut, is contained in a thorny shell.



site westward of that city, would answer for the position of Sângala and Pimprâma. But although a channel of the Ravi runs under the walls of Lahore, and although its position must have given it consequence from an early date, yet we learn from all the traditionary ballads of the Punjaub that Lahore was called in olden times Oodimugri.

Arrian relates no more regarding the Bâri Doábâ. But Curtius states that, on leaving Sângala,\* Alexander came to a strong city prepared to resist him, but for a sedition which opened to him the gates; that he spared this and other cities which submitted, and then came into the kingdom of Sophis, or the Sophitis, of whose dress, laws and manners, he gives a most interesting account. "A race," he says, "although barbarous, of surpassing wisdom and excellent morals. The children are not educated at the caprice of their parents, but entrusted to persons appointed to instruct them. The deformed are destroyed. Marriages are sought, not for the sake of rank and connection, but for the beauty of the parties." Their king Sophis, or Sophtis, was dressed in a gown of purple descending to the feet. He wore golden slippers, his arms and wrists were enclapsed in pearls, and large and lustrous

\* Ipse cæteros ad urbem validam in quam aliarum quoque confugerant incolæ, duxit. Oppidani missis qui regem deprecarentur, nihilominus bellum parabant. Quippe orta seditio in diversa consilia diduxerat vulgum; alii omnia deditione potiora, quidam nullam opem in ipsis esse ducebant. Sed dum nihil in commune consulitur, qui deditioni imminebant, apertis portis hostem recipiunt, &c. &c. Hinc in regnum Sophitis perventum est. Gens (ut barbari) sapientiâ excellit, bonisque moribus regitur. Genitos liberos non parentum arbitrio tollunt aluntque, sed eorum quibus spectandi infantium habitum cura mandata est. Si quos segnes aut aliquâ membrorum parte inutiles notaverunt, necari jubent. Nuptiis coeunt non genere ac nobilitate conjunctis, sed electa corporum specie, quia eadem æstimatur in liberis. Hujus gentis oppidum cui Alexander admoverat copias, ab ipso Sophite obtinebatur. Clausæ erant portæ: sed nulli in muris turribusque se armati ostendebant: dubitabantque Macedones deseruissentne urbem incolæ, an fraude se occulerent; quum subito patefacta porta, rex Indus cum duobus adultis filiis occurrit, multum inter omnes barbaros eminens corporis specie. Vestis erat auro purpurâque distincta, quæ etiam crura velabat. Aureis soleis inseruerat gemmas; lacerti quoque et brachia margaritis ornata erant. Pendebant ex auribus insignes candore et magnitudine lapilli. Baculum aureum berylli distinguebant: quo tradito precatus ut sospes acciperet, se, liberosque, et gentem suam dedidit. Nobiles ad venandum canes in ea regione sunt, &c. ix. 1.



gems depended from his ears. In his hand was a golden sceptre studded with beryls, more probably turquoises. What a complete picture is this of a Punjaubi prince of the present day, unaltered by the lapse of twenty-two centuries. But, alas, in what country of the wide world, barbarous or civilized, shall we find the race that will not prostitute their daughters at the accursed shrines of ambition and of mammon? In this country Alexander found dogs, four of which would attack a tiger. Dogs so staunch, that when once they had seized the quarry, they would suffer themselves to be cut piecemeal rather than relinquish their hold!

From this region he came to the Hyphasis and found Phegelas, king of the people there, who received him with tribute. Halting there two days, he then prepared to cross the Hyphasis; difficult of passage not only from its breadth, but on account of *rocks* in the channel.

King Phegelas and Porus both assured Alexander that on crossing the Hyphasis he had eleven days' march through vast deserts, which would bring him to the Ganges, the largest of Indian rivers. That the farther bank was occupied by the Gangaridæ and Pharrasii, whose king Aggrammen obstructed the advance, with 20,000 horse, 200,000\* foot, 2,000 chariots and 3,000 elephants. The said Aggrammen being a handsome barber, who, having won the affections of the queen, had murdered the king and the royal children and had usurped the government. Doubting whether his army would follow him upon such an enterprize, Alexander called a council and found them resolute to proceed no further. This is the account of Curtius.

Arrian mentions no particulars of Alexander's progress from Sāngala to the Hyphasis.† He says that the Mulliks beyond the Hyphasis were wealthy, that they tilled the soil, yet were soldiers and just statesmen, and had more and braver elephants than other inhabitants

\* Curtius says, "ducentisque peditum," but there can be no doubt that he meant "ducentis millibus."

† Τα δὲ δὴ πέραν τοῦ Ὑφάσιος εὐδαίμονά τε τὴν χώραν εἶναι ἐξηγγέλλετο, καὶ ἀνθρώπους ἀγαθοὺς μὲν γῆς ἐργάτας, γενναίους δὲ τὰ πολέμια, καὶ εἰς τὰ ἴδια δὲ σφῶν ἐν κόσμῳ πολιτεύοντας. Πρὸς γὰρ τῶν ἀρίστων ἄρχεσθαι τοὺς πολλοὺς, τοὺς δὲ οὐδὲν ἔξω τοῦ ἐπιεικοῦς ἐξηγεῖσθαι\* πλῆθος τε ἐλεφάντων εἶναι τοῖς ταύτῃ ἀνθρώποις, πολὺ τι ὑπὲρ τοὺς ἄλλους Ἰνδοὺς, καὶ μεγέθει μεγίστους τε καὶ ἀνδρείῳ. Ταῦτα δ' ἐξαγγελλόμενα Ἀλέξανδρον μὲν παρώξυνεν εἰς ἐπιθυμίαν τοῦ πρόσω εἶναι αὐτόν· οἱ δὲ Μακεδόνες ἐξέκαμνον ἤδη ταῖς γνώμας, &c. Arrian, v. 25.



of India. In the protected Sikh States (as they were called) the same may yet be found. Arrian is silent about the rocks of the Hyphasis. He says that Alexander prepared to cross the Hyphasis, but that the Macedonians, disheartened with toil and peril, refused to follow him.

Now from the foregoing account the following queries naturally suggest themselves :—

1st. Who were this warlike tribe of Kathaioi, who had such abundance of waggons, and used them, as tented tribes might, for ramparts?

2nd. Who were the Sophtis, in juxta-position, whose king wore robes descending to the feet, and whose country produced tiger-hounds. Who were the *'Αδραϊσταί* at Pimprama on the Hydraotes?

3rd. Who were the Phegelas? living on the right bank of the Hyphasis according to Curtius, and the Præsii living beyond the river, according to Plutarch?\*

4th. Is the Hyphasis the Beyass or the Sootlej? If the Sootlej: then which is the Hysudrus?

5th. How could Alexander have found rocks in either?

6th. How can we reconcile the distance noted by Curtius as intervening between the Hyphasis and Ganges, of eleven marches of desert, with the actual space of twenty marches or two hundred and twenty miles to Hurdwar, or twenty-three marches to Delhi on the Jumna?

7th. Who was king Aggrammen, and where was his capital?

8th. How was Alexander to reach the Ganges until he had crossed the Jumna?

9th. The Gangaridæ are no doubt the people of the Ganges; but who are the Pharrasii beyond the Ganges?

Upon all these heads I can offer little more than conjecture; nor does it seem to me probable that the greater number will ever be satisfactorily solved.

Who were the Kathaioi? There is a people chiefly inhabiting the Punjaub, which differs in some respects from every other people of Asia. I speak of the Kuttris. In the provinces south of the Sootlej, the name Khethri or Kshethri appertains to the Rajpootre tribe in all

\* I have only Langhorne's translation to refer to.



portion of which is to this day found the Tázia or tiger-hound; though the spread of cultivation having extirpated the tiger, and the antelope itself being rare, the Tázia hound will also soon disappear. The robe flowing to the feet may still be seen in some districts. At Singhoa on the right bank of the Jelum it is still worn. It is singularly graceful. Whether the Kathaioi were the Kuttri tribe, or the Rajpootre\* tribe of Katul, the large number of their waggons seems to denote that they were the Bunjaras, or itinerant grain merchants, of the day. If the waggons had been used as in Scythia, the people had not been found inhabiting a city. The name Kathaioi savours indeed of China. In Russia it would signify Chinese. But the Kuttri at least has no Tartar blood, although he may be one of the aboriginal tribes of Kathay, driven to migrate by the spread of Tartar hordes westward. However this be, there seems little doubt that the old town Katooha on the right bank of the Ravi was founded by the Kathaioi, whoever they were.

We find it difficult to recognise in the cheating, lying Greek of modern days the representative of the heroes of Leuctra and Thermopylæ;—in the over-reaching, crouching, sordid Jew, the valiant guardian of the Divine oracles;—in the peaceful Bhara and Parsee devoted to gain, the murderous assassin and gallant ghubbre;—and it may be equally hard to think the Kuttri of the Punjaub the Kathaioi who so long set Alexander at defiance, or to believe the assertion of this mercantile race that they are of the same blood as the hero Rám. Yet the handful of horse, who so electrified some of our squadrons in the late war, were probably, one half at least, innocent, meek, pains-taking, ghee-retailing Kuttris.

It must be observed that in the Punjaub any profession but that of arms degrades the Rajpootre. That, whereas in our provinces the Rajpootre thinks it no disgrace to drive the plough; in the Punjaub he loses his name of Rajpootre thereby, and becomes merely Thakoor, and can no longer aspire to the daughter of a house which has always followed the profession of arms. Numbers of these degraded Rajpootres have become converts to Islám, and there seems to be some

\* This Rajpootre tribe I have found at Chota Soochaytgurh near Gumrola, and they assure me that they have many families dwelling near Lahore.



idea in the Punjaub that the Juts and Goojjurs\* are degraded Rajpootres. It is difficult therefore to say what is the origin of the designation, Rajpootre, and to whom it was originally applied, and when first invented. Most probably it was first assumed by strangers entering a new country, where their claims could not be disputed for want of evidence, and it becomes a curious query, whether Indo-Greeks, sons of Greek fathers and Goojjur mothers, carrying their arms from the Punjaub southward were not the first self-styled Rajpootres. As the whole system of Hindu idolatry (I speak not of their once pure Deism) appears to have been introduced by the Egyptian conqueror Osiris and the Macedonian Alexander, so it is natural to believe that the originators of the system of mythology would reserve for themselves a choice place amongst the castes arising therefrom; and as the illustrious families of Greece boasted descent from Hercules, so the Rajpootre boasts to be the offspring of Heri,† who without doubt is identical with Hercules.

Both the account of Curtius and the circumstances of the case render it almost certain that Alexander reached the Sootlej. Had only the small and fertile Jullundur Doaba remained to be conquered, the Macedonians had never broken into rebellion on account of a campaign of a fortnight. Neither is it at all probable that Alexander left so important and valuable a possession unconquered. Whether the Beyass in that age coursed W. S. Westward, almost under the walls of Kusoor, or joined as at present the Sootlej by a course nearly South West,‡ it may appear marvellous that so particular an historian as Arrian, and one who had made geography his study, should not at all mention its evidence. But still more marvellous were it, that the

\* In Upper Huzara is still found a Chowkan branch of the Goojjur tribe. They style themselves Rajpootres and Goojjurs.

† The name Hericulea is still borne by women in Bengal.

‡ The Sootlej after its confluence with the Beyass takes the new title of Gurra.

The Sootlej,—Suttadra,—Hysudrus, was regarded by Arrian as tributary to the Beyass, as we learn from the following passage. Καὶ τὸν Ὑφασιν ἐπὶ τούτῳ ὁ Ἀλεξάνδης παραλαβὼν τῷ αὐτῷ δὴ ὀνόματι ἐς τὸν Ἰνδὸν ἐμβάλλει. ξυμβαλὼν δὲ ξυγχωρεῖ δὴ τῷ Ἰνδῷ. Arrian, lib. vi. cap. 14. If therefore Alexander was about to cross at the Hurri ké pultun ferry of the Sootlej; Arrian's omission of the Hysudrus



Sootlej, a river so much larger and more important, the barrier between two empires, should escape his notice. The difficulty is scarcely cleared by taking Alexander to Hurri ké pultun, whither he might have been attracted by the fame of Hercules, who gives it name, and whose exploits it was his ambition to surpass: for it was his system to build, not merely to overthrow: to establish his empire in every conquered province ere proceeding in advance: and the rich and important Jullundur Doaba would never have escaped his notice, being in fact the gem of the Punjaub. Neither is it likely that with the choice between the long desert tract by the Hurri ké pultun and the comparatively fertile country of the Jullundur and Loodiana route, with an army discouraged by the prospect of fresh toils and privations, Alexander should deliberately select the less inviting road.

It is therefore my belief that Alexander's progress was arrested at the Phullore ferry. The rocks recorded by Curtius were unknown or forgotten by Arrian. Curtius's history, though evidently compiled from authentic sources, wants symmetry of parts, a defect which is apt to mark a compilation from several different authors, and to which his ignorance of geography and of tactics afforded him no check.

It seems to me the less of two great difficulties to assume that Alexander meeting with ready submission in the Jullundur Doaba and no check or difficulty at the passage of the Beyass, both were passed over with little notice in the lost histories of Ptolemy and his contemporaries; and that subsequent historians knowing that the Punjaub derived its name from its five rivers, and counting the Indus as one of them, were perplexed by the occurrence of a sixth and dropped altogether *that* which was most slightly indicated, in the belief that it was a mere torrent or an arm of the fifth river.

is explained because Arrian calls the river there by the name of Hyphasis. In this case he may have found it sufficient to detach a division of his army to take possession of the Jullundur Doaba. The name, however, Phugla seems to refer to Phuglore or Phullore, and the difficulty of procuring material for the construction of the altars would have been tenfold at the Hurri ké pultun.

I can no where find in Strabo any mention of the R. Hysudrus. Pliny makes it 168 miles from the Hyphasis, and the distance between the Hydaspes and Hyphasis 3,900 or 4,900. In fact Pliny writes not Geography, but Romance.



Curtius's and Arrian's description of the people and country beyond the terminal river will answer only the land and people south of the Sutlej. From Loodiana, eleven marches for an army, of eleven miles each, would exactly bring Alexander to Kurnaul, where the "*vastæ solitudines*" (not altogether obliterated by cultivation even in the present day) cease, and he would find himself in contact with the dominions of king Aggrammen and with his countless army. This tract as appertaining to Gangetic India would easily be accepted by an historian so ignorant of geography, for the Ganges: being in fact the land of the Jumna. Kurnaul is about five miles from that river. This interpretation will reconcile many difficulties which Arrian's silence and Curtius's random record have left for our disposal.

In this case we may assume that Phullore is the modern corruption of Phegela or Phuglore, where Alexander built the twelve gigantic altars\* that were to bear record of the limits of his conquest. And we may surmise that Agra (one of the oldest Hindu sites in India) was at that time the capital of Hindustan, and that Maun was the name of the usurping barber. The greater salubrity of the banks of the Jumna has ever given it the preference over its more sacred rival, the Ganges, as the site of capital cities.

It would perhaps be difficult to imagine any site better adapted to the purpose of Alexander, than that of the present castle of Phullore. The position is conspicuous, yet so remote from the action of the river Sutlej as to allow no cause for apprehension of its being undermined, and it stands at the grand gateway, so to speak, of the Punjab southward, which was also the first approach from southern lands to the majestic empire he had just completed, more by his wonderful tact and justice and gentlemanly bearing than even by his military genius and dauntless courage.

Of these altars Arrian says: "There allotting to the army their several parts, he commanded them to build twelve altars, in height equal to the loftiest towers, in solidity exceeding towers, grateful offerings to the gods, who had so far led him in triumph, and memorials also of his own labours." Curtius says: "Two days were consumed in anger, on the third he came forth and erected twelve altars of squared stone, as a monument of his expedition: he also ordered the defences of the

\* Pliny however says the altars were built on the further bank.



camp to be enlarged and beds to be left of larger size than suits the human frame; that he might exaggerate the appearance of all things, deceptively fashioning miracles for posterity." Strabo says: "Alexander, upon the limits of his Indian expedition, placed altars at the utmost point to which he had attained Eastward, imitating Hercules and Dionysus, whose practice it had been."\* Pliny, (I quote from Holland's translation,) says, "from which (i. e. Udaspes) to Upasis, a river of no lesse account than the other, 4900 or 3900 (query miles? or stadia?) and there an end of Alexander's voiage. Howbeit, he passed over the river, and on the other side of the banke, hee erected certaine altars and pillars and there dedicated them."† Plutarch says: "However, he first contrived many vain and sophistical things to serve the purposes of fame: among which were arms much bigger than his men could use, and higher mangers and heavier bits than his horses required, left scattered up and down. He built also great altars

\* "Ενθα δὴ διελὼν κατὰ τάξεις τὴν στρατιάν, δώδεκα βωμοὺς κατασκευάζειν προστάττει· ὕψος μὲν, κατὰ τοὺς μεγίστους πύργους· εὖρος δὲ, μείζονας ἔτι ἢ κατὰ πύργους· χαριστήρια τοῖς Θεοῖς τοῖς ἐν τοσόνδε ἀγαγοῦσιν αὐτὸν νικῶντα, καὶ μνημεῖα τῶν αὐτοῦ πόνων. Ὅτι δὲ κατεσκευασμένοι αὐτῷ οἱ βωμοὶ ἦσαν, θύει δὴ ἐπ' αὐτῶν, ὡς νόμος· καὶ ἀγῶνα ποιεῖ γυμνικόν τε καὶ ἵππικόν. Arrian, v. 29.

Tertio die processit, erigique duodecim aras ex quadrato saxo, monumentum expeditionis suæ; munimenta quoque castrorum jussit extendi, cubiliaque amplioris formæ quam pro corporum habitu relinqui; ut speciem omnium augeret, posteritati fallax miraculum præparans. Q. Curtius, ix. 3.

A gigantic iron stirrup was some years ago found near the Indus. The people attributed it, some to Alexander, some to Raja Russaloo. A curious tradition exists of the conquest of Publi, in Huzara, by the Sahanties from beyond the Indus. The Sahanties are more celebrated for contrivance and wiles than for courage. Their chief, arriving by night at the shrine of Meeán Kháki in Publi, departed before daybreak, leaving behind him an iron drinking vessel of capacity to hold 300 lbs. of water; an iron club, thirty feet in length; and a pair of well worn slippers, six feet in length. The people in the morning came timorously to peep at the redoubted Sahantie invader. They found, not him, but these gigantic tokens of his visit: struck with terror, a general council was called, and the submission of the valley was tendered to the Sahantie. This event may not be wholly unfounded on fact, and if so, the device may have been suggested by some tradition of Alexander's trick.

\* Ἀλέξανδρος δὲ τῆς Ἰνδικῆς στρατιᾶς ὅρια βωμοὺς ἔθετο ἐν τοῖς τόποις εἰς οὓς ὀσάτους ἀφίκετο τῶν πρὸς ταῖς ἀνατολαῖς Ἰνδῶν, μιμούμενος τὸν Ἡρακλέα καὶ τὸν Διόνυσον. Strabo iii. 171.

† See Pliny vi. Book, —p. 125, Holland's translation.



for which the Præsians still retain much veneration, and their kings cross the Ganges every year to offer sacrifices in the Grecian manner upon them."\* Robertson says: "The scene of this mutiny was on the banks of the Hybasis, the modern Beyah, which was the utmost limit of Alexander's progress in India. From this it is manifest that he did not traverse the whole extent of the Punjaub. Its Southern boundary is formed by a river anciently known by the name Hysudrus and now by that of the Setlege, to which Alexander never approached nearer than the Southern bank of the Hyphasis, where he erected twelve stupendous altars, which he intended as a monument of his exploits, and which, if we may believe the biographer of Apollonius Tyaneus, were still remaining with legible inscriptions, when that fantastic sophist visited India 370 years after Alexander's expedition."†

Now as there is no building stone in the Sutlej below Roopa, it is difficult to imagine this gigantic work progressing with such speed as to be consecrated, with incense offerings by Alexander ere his return from the river. The same difficulty occurs with the Beyass, which below Indore can scarcely be said to have building stone. We must suppose therefore that the tufa,‡ of which the great tope at Manihrgala is constructed, served Alexander for materials, the debris being burnt into lime. It does not seem probable that Alexander would have built those altars in any obscure corner under the mountains, off the road of commerce. If they were on the Beyass, we should look for them from Mirthul to the Sutlej. If they were on the Sutlej, either Phullore (which I think the most probable,) or Hurriké pultun or Feeroozpore must have been the site. Alexander erected, we have seen, twelve gigantic altars equal in height and exceeding in solidity the grandest towers. What was the ground plan of this memorable monument? Symmetry suggests a square of four higher towers girt with eight towers of less altitude; which is precisely the figure of many of the castles of the Punjaub

\* See Plutarch—Alexander—Langhorne's translation.

† See Disquisition concerning India.

‡ Not only the topes, but a more ancient Hindu temple at Kuttahss, ascribed to the Pandoos, is built of tufa—great part of which in the latter temple has been dissolved. It is however far more durable than the red and yellow sandstone used in the Indo-Greek buildings of this Doaba.



to this day, and I never look upon one of those graceful structures without the impression that a model of the Greek altars is before me. It is far from being the sole memento of that remarkable race. The Sikh of the present day, who like the Lacedemonian is sworn from youth to arms, wears like him uncut hair, and gathers his turban into folds exactly resembling the low Grecian helmet; and the practice of chaunting triumphal songs, I have already had occasion to mention.\* The vine and the olive grow just so far as their steps have trod, and every old site westward of the Jelum teems with gems, coins and sculpture breathing of the Grecian hand.

## APPENDIX.

*Taxila*.—Oriental scholars are fond of identifying the modern village of Tukhtpurri, or Turruckpurri with the Taxila of Greek History and the Tukshasilla of the Sanskrit records. But it appears to me that the grounds of the identification are insufficient. Tukht signifies a throne, and is a Persian word. Turruck signifies a hyæna, and is a Hindi word. Tuk signifies a balance or test, and is Sanskrit. Purri is Hindi, and Shilla Sanskrit, both signifying a stone, or, slab of stone. The force upon Tukhtpurri or Turruckpurri to reduce it to Tukshasilla,† and from thence to Taxila seems to me unwarrantable. For the first syllable must be wholly dispossessed of its signification to suit the convenience of the transposer, merely because there happens to be a jingling resemblance in sound between Tuk and Tukht. A new syllable “sha” must be created for it, and the ultimate and penultimate syllables must be translated into another language to complete the transformation.

\* Arrian speaking of these songs as offered by the Indians to Alexander as his fleet dropped down the Hydaspes adds: φιλωδοὶ γὰρ εἰπὲρ τινες ἄλλοι, Ἴνδοι, καὶ φιλορχήμονες ἀπὸ Διονύσου ἔτι, καὶ τῶν ἅμα Διονύσῳ βακχευσάντων κατὰ τὴν Ἰνδῶν γῆν. Lib. vi. chap. 3. It is only the older tribes of the Punjaub that have this custom.

† There is not a doubt that Cashmere might be converted into Windermere with less trouble. For instance Cahch, glass; Winder, in the vulgar dialect, quasi window, made of glass; and Mere, a lake, common to both: the glassy lake!!



With such license there are few words or names of three syllables that might not be converted into almost any other word or name of four syllables.

We are distinctly told by Curtius that Taxiles was the family name, Omphis\* the personal name of the prince of the country; that all princes of that house were called Taxiles; and that the capital was Taxila, the largest city between the Indus and the Hydaspes. Now, in this country people never take their names from towns or villages, but ordinarily the villages are called after the name of the founders. Here then our etymologists would present us with an ancient gentleman named Raja Rockingstone, or Raja Touchstone, for the mere purpose of bequeathing his queer name to his capital. If the capital was Tukshasila the Raja was undoubtedly Tukshasili.

There is nothing whatever in the appearance of traditions of Tukhtpurri to justify an assumption of its antiquity, or the belief that it ever could have been the chief town of the Sind Sagur Doaba. The sole monument of which any record remains, is part of a comparatively modern brick wall of a Gukka palace, attributed to the Gukka princess Tukht Bánú; to whom, according to some, the village owes its name and its origin; excepting this poor memorial, the village appears never to have possessed any buildings but huts of mud or of unwrought stone, mud cemented: and what consequence it ever possessed seems to have been due to the accident of having formed the capital of one of the petty sovereignties of the Gukkas, when that kingdom had been subdivided. As already mentioned, it is more than a mile off the high road and so entangled among ravines, to which indeed it owes its existence, in the water they supply, as to be difficult of access. Its position is not at the junction of any important thoroughfares, and the traveller knows of its existence only through maps. The soil on which it stands is not raised by the decay of edifices as in all Indian sites of antiquity.

Purri, signifying a stone, or, stone slab, is a common terminal to villages in this Doaba, as for instance "Bulbulpurri." The terminal

\* Omphis, permittente Alexandro, et regium insigne sumpsit, et more gentis suæ nomen, quod patris fuerat. Taxilen appellavere populares, sequente nomine imperium in quemcumque transiret. Q. Cur. viii. 12.



Silla, also, unaltered by translation to Purri, is common, as "Soorh-silla," a village six koss eastward of Atuk, and about ten koss from Hussun Ubdal. And "Habsilla," a little town and castle near Pindi Ghayb.

When a town or a village changes its name, if the change be not merely that of pronounciation, it is total. We never find a name half translated and half left in the original tongue. Pentonville may be changed hereafter to Warwick or to Brighton, but not probably to Pentonton. When the name is changed, if the change be not a mere inflection of sound, it will be total; the work of some conqueror who has destroyed and rebuilt it, or of some benefactor who has improved it, or of some fanatic sect who think there is religion in sound, or of some saint whose relics are there deposited. The use of a name to a city is not to describe its peculiarities, but to enable people to find it and to speak about it intelligibly. It can be altered only when a large body of the community are interested in the change. It is very true that the first name of a place is often a description of some peculiarity, as in the case of Turrupurri, the hyæna's rock, or Tukhtpurri, the slab of stone; because until a place has received a first name, it can be spoken of only by description; as the first Egyptians wrote in hieroglyphics. But the name once established becomes the letter of an alphabet, and people cease to enquire its original meaning or value.

Let us take the instance of Hussun Ubdal. Its oldest name recorded in tradition is Jullal Sirr, the glorious fountain, or, fountain of glory, from the noble spring which there leaps into being from the living rock. Its next name was Hussun Ubdal, from one Hussun, of the Ubdali tribe (still extant in Publi, Huzara), and its latest name, given by the Sikhs, is Punja Sahib, the Sahib's, i. e. Saint's hand-print, from the impression of a hand attributed to the Saint Gulab Dass, although the mason who chiselled it is still alive in the neighbourhood. All these changes are total. Jullal Sirr was not changed into Jullal Chok, nor Hussun Ubdal into Hussun Dewana. The first of these names, Jullal Sirr, being Persian, the place must almost certainly have had an older Hindi name, now lost for ever, unless it be, as I suppose, the Taxila of history.

A Pundit of this place would translate Tukshasilla as the Touchstone or Test-stone. But if it be not Taxili which took its name



from Taxiles, I think it more probable that the place was so called from a rocking-stone now displaced or lost. For touch-stones are pebbles of black jasper found only in small masses and removed for the use of goldsmiths wherever found. If the Pundit's translation is correct, Tukshasilla was most probably on the Indus, where the touch-stone is common. It is found only in the beds of rivers; whereas the rocking-stone, which would be a durable monument, occurs both in the sandstone and in the lime formation. It is however, not probable that Alexander's friend was either Rájá Rockingstone or Rájá Touchstone.

The same Pundit informs me of a Rájá Tuksh of Cashmere celebrated in the following slokas from the Rámáyana.

युधजितमातुलेन आहूतो गान् मसैन्यकः । भरतः काश्यपे देशे हत्वा गन्धर्वनायकान् ॥  
पुष्करं पुष्कराक्षे तु तक्षं तक्षशिलाहवे । स्थापयित्वा तु तौ पुत्रौ अयोध्यामागतम्  
पुनः ॥

“Yoodhajit, his maternal uncle, leading an army through Cashmere summoned Bhurta, having smitten Gundharu kings: and having instated Pooshkurrin (son of Bhurta) at Pooshkurrah (in Cashmere) and Tukshun (son also of Bhurta) in Tukshilla (of Cashmere) returned to Ayoodia.”

Rájá Tuksh may have been king of Cashmere, but Taxiles was prince only of Potawar Satur of Chuch. The throne of Tuksh would very probably, if made of stone, be called Tukshilla, but Rájá Tuksh would not have been called Taxiles by the Greeks. He would have been called simply, *Tuḡ*, *Tux*.

Professor Wilson in his *Ariana Antiqua* writes thus of Turruppurri, or rather of Manikyala in its neighbourhood. “In 1808, the embassy to Cabul, conducted by Mr. Elphinstone, when upon their way back to India, arrived at a part of the country between the Indus and Jelum in which, according to the notions of Col. Wilford, the capital of Taxiles, the ally of Alexander was situated.” The party sent to search for the city found the tope of Manikyala which is described, he then proceeds: “Its geographical position leaves little doubt of its being the site of the capital of Taxiles, or more correctly speaking of the city Taxila, the Tax-sila of the Hindus; and the identity is confirmed by the ancient remains scattered about the country. The



party that visited Manikyala saw no other vestiges of an ancient city than the tope: but in this they were deceived by the hurried nature of their excursion: they had not time to search, and rather hastily inferred that nothing was to be found. Twelve years afterwards Moorcroft crossing the spot was informed that old wells, fragments of pottery and ancient coins were frequently discovered. Lieut. Burnes obtained while there, old coins and antiques; and M. Court, whose opportunities have been still more propitious to discovery, describes the neighbourhood as strewn with ruins, the remains of massive walls, of old wells and of tombs and temples. He found also and opened no fewer than fifteen topes.\*

Now, these ruins have been three times sought for by me without success. A very few Cashmerian and Buddhist coins are found in the neighbourhood, as in every old village in this Doaba, but nothing that can justify the belief that a city was ever in the neighbourhood. The only ruins I could find of tombs were those of Sooltán Audum and his successors, Gukkas, at Rabaht, dating back to the 16th century. That Manikyala is an old Buddhist site is without doubt. But that it ever was a city there is not only no proof, but absolutely no probability, and the Buddhist era is considerably posterior to the invasion of Alexander. Hear what the Chinese traveller Hiang Tsang says of Manikyala: "Au sud de Mengholi, Manghul, a 400 li mont Yilo (Jilha perhaps) et a 200 li grande forêt Mahafana† (Mahabunn). De la au nord ouest a 30 au 40 li, Maiukialan, monastere des Fèves. De la a l'ouest, a 60 ou 70 li, monastere fondé par Asoka," the last being the great tope on the Western bank of the river Sohaun, and both topes having been the sites of Buddhist monasteries, not of cities.

\* Any reader might suppose that M. Court had found fifteen topes at or close to Manikyala. But the nearest tope to the grand tope of Manikyala is that West of it, about nine miles on the right bank of the Sohaun river, and the remaining fourteen topes were probably those of Khaunpore distant Westward from Manikyala about forty miles.

† It is difficult to say where this Mahabunn, great forest, lay. Mt. Mahabunn lies about 200 li from Mahugul, but due West, not South. This Mahabunn seems to have been intermediate between Mahugul and Mt. Tilha, a celebrated Teerut, i. e. close to Manikyala. The country at present has no forest, though abundance of thorny jungle.



There is indeed no indication in this traveller's account of any city in the neighbourhood. Nor do the Buddhist priests seem to have affected the immediate neighbourhood of cities for the erection of their monasteries and topes. But let us see what the same Chinese traveller says of Taxila. Starting from the Atuk ferry, called by him, Ou to kiahantchha, and identified beyond question, by the presence within three miles of the city Pholotoulo, (i. e. Mullyetoolla, the present Atuk), he says "Passant au midi le Sind qui est large de 3 ou 4 li et coule au Sud oest on vient a Tancha chilo (lemite de l' Inde du Nord) dependant du Cachemire," and again "On passe le Sind au Nord de ce pays." Now although the distance from Atuk to Tancha chilo (Tarchailia) is not mentioned by the Journal, yet it appears to have been the first considerable place on that route which answers exactly to Hussun Ubdal, but not to Turruppurri, and no one will presume to say that the river Sind is passed north of Turruppurri, whereas this is exactly the fact with regard to Hussun Ubdal. Professor Wilson has not done justice to Mountstuart Elphinstone's research. Had there been ruins of a city at Manikyala he would assuredly have found them. The travellers who have since his mission passed through and dwelt in Afghanistan have added little to the researches of this accomplished historian, who was prevented by circumstances from entering the country he has described so faithfully. The "chilo" of the French translation was probably intended to be read Khilo, for we see in the name of the capital of Gundhara (Kiantolo) that he has for Pekawur\* (the Peukelaotis of the Greeks) Pou lou cha poulo, identified by bordering the Indus, and having Chang moukia Phousa, (Chummukia, a considerable town) in its neighborhood.

Professor Wilson's argument seems to regard the sites of Manikyala and Tukhtpurri as one. But there is no visible connection between them, whilst an interval of five miles separates them. Tukhtpurri has not a tope nor a mound nor any other trace of Boodhism in its immediate vicinity. It is a modern looking village, in a wretched ravine-worn arid country, considerably off the highroad.

Let us now consider the site of Hussun Ubdal, known to the

\* Pekawur. Peshawur is so called by the Pathans, and this is manifestly the name it bore in Alexander's time. Pekawur may be a contraction of Pookhtoo wur, the gate or entrance to the speakers of Pooktoo, or Pushtoo.



readers of Lallah Rookh, as "those royal gardens which had grown beautiful under the care of so many lovely eyes and were beautiful still, although those eyes could see them no longer." Although there is no more resemblance between the Hussun Ubdal of the poet and the Hussun Ubdal of the traveller, than between the Cashmere of Lallah Rookh and the Cashmere of Goolab Singh, yet there is no spot from Peshawur to Lahore, if we except a tract of the Jelum off the highroad, that can be compared with Hussun Ubdal as the site for a city; whether we consider the comfort of the traveller or the requisitions of the merchant. At Hussun Ubdal the great western road of commerce from Hindustan and the Punjaub to Cabul meets the principal commercial road between Cabul and Cashmere, and another from Pind Dadun Khan and Mooltan. Here two small rivers of the clearest water leap at once into being from the living rock, and nourish by their abundance a shadowy foliage most grateful to travellers upon this desolate tract.

The oldest name for this place of which any record exists is, as already stated, Jullal Sirr, "the glorious fountain." But this being Persian, was probably preceded by a Hindee name, now lost to us. It has since twice changed its title, first to Hussun Ubdal\* and afterwards to Punja Sahib. The last, being a Sikh name, is fast disappearing since the destruction of the Sikh empire.

Now this town Hussun Ubdal was, until twelve years ago, the capital of the Tarkhaili clan, who then occupied the country in which Alexander found Taxiles and the city, called after the clan, Taxila. Cities and villages in this part of the world never give their names to tribes but generally take their names from tribes or founders, and if Hussun Ubdal was founded by the clan Tarkhaili, or first rose into consequence as their capital, (which it was fourteen years ago,) there can be little doubt that it was called Tarkhailia, which the Greeks would write Taxila as certainly as they would write Tarkhaili, Taxiles.

But here we arrive at an enigma the solution of which appears remote. For although the Tarkhaili clan inhabit the very spot on which Alexander found Taxiles, and although, excepting the Gukkas, they are the most powerful and remarkable family in this Doaba,

\* At Hussun Ubdal is a mound called to this day Tukht Ubdal, the throne of Ubdal. Tukht seems at some remote period to have been a common affix to towns.



connected by tradition with Atuk and claiming past authority up to that fortress and to Chehl a Jungie, East of Morgulla, which gives them exactly what I conceive to have been the dominion of Taxiles, viz. Gundgurb, Kurri, Hurrah, Chuch, and Qatur, yet they disclaim altogether this history, calling themselves Yoosufzyes and tracing their genealogy only eight generations back to Tar Khaun,\* whose grandson Boolind crossed the Indus with the conqueror Ahmed Shah, from whom he fraudulently obtained the grant in Jaghir of Gundgurb, Hurrah and Kurri.

That the old Tarkhaili clan should have been driven into banishment trans-Indus is not at all wonderful. That they should there have nourished the remembrance of their lost power and have bequeathed the record from father to son is quite natural: nor were it any novel phenomenon to find Ahmed Shah using their agency as the means of his own conquests. But the difficulty is in their belief that the Tar Khaun of Ahmed Shah's day was the founder of their clan and name.

Still, it is so difficult to imagine any other Punjaubi name that could be made into Taxiles, or to imagine two distinct families of Tarkhaili, the one succeeding to exactly the power and realm of the other after a lapse of 2000 years, without any affinity; that I should prefer the surmise, either that the genealogy is imperfectly preserved or that there were two Tar Khauns in the family at long intervals of time. The genealogy of the Tarkhailis is not preserved in writing and they have no bards.

As to the supposed difficulty of Taxiles having been an Eusufzye, it is in fact no difficulty. The Yoosufzye, who call themselves to this day† Issupzye, are beyond doubt the Aspasioi of Arrian, as the Astakenoi,‡ or tribe of Ashta Khan, of Arrian, are the founders of Hustnugur,

\* The genealogy runs thus. It is not preserved in writing and they have no bards to preserve it in song.

1st. Adeen Khaun, Jogi Khaun, Tar Khaun, Taj Khaun, Boolind Khaun, Futteh Khaun, Zuffar Khaun, Sher Zemaun Khaun, Khaun i Zemaun Khaun, Khyrooddeen Khaun, living.

† Yoosufzye should, I believe, rather be written and pronounced Asifzye, which runs easily into Aspasioi. Asif and Afghana are the two fathers of the Pathan race.

‡ In spite of Professor Wilson's objection to the title or terminal, Khaun, as Turkish, and therefore not introduced until the time of the Turkish conquests; the constant occurrence of this terminal in countries and tribes where still in use renders it almost certain that it was known there in Alexander's day. The tract we



both still occupying the sites in which Alexander found them. Again we have in the Moosazye, or children of Moses, the Μουσικανοί of Strabo,\* still occupying their old habitat at the S. Western roots of Mt. Mahabunn; whilst the Assazyes, or children of Asa, are found where Alexander found their fathers the Assakanoi, or tribe of Asa Khaun.

Again the Πακτυκοί of Herodotus who dwelt upon the Indus conterminous with the mountains are as certainly the Pookhtoo auka,† or, Pooktoo marr, as they are still called by other tribes, i. e. the speakers of Pookhtoo (Pooshtoo) or Afghans, Eusufzye, &c. whilst the Πευκελαῶτις of the Greeks is to be found only in the Pooktoo rendering of Peshawur, viz. Pekawur; called so to this day, and very probably derived from "Pooktoo," Pooshtoo, and "wur," a door or entrance, the entrance to the Pooshtoo speaking tribes.

So many Mosaic and Afghan names found in their present habitat a thousand years before the Hijra, are proofs that the Afghans truly derive their origin from Israel, as they could not have been received from the Arabs with the religion of Muhammed, and lead at once to the important query, whether the sublime truths found in the older books of the Hindus may not have been derived from Mosaic traditions which must have been long preserved by these Israelitish tribes with the tenacity characteristic of their race.

We must not trust the particular accounts of the Afghans themselves in which they seek to connect themselves with Ali the great hero of Afghanistan. The utter confusion of all chronology in the narrative is in itself evidence of its fallacy. But the general deduction of their line from Israel is confirmed by many evidences; not the least of which is their close resemblance, moral and physical, to the Israelitish race. Of this derivation none but the children of Israel would boast, for the name is a byword and reproach amongst all other nations.

Some have entertained the idea that Alexander crossed the Indus at Taxila, and that Atuk is the site of that city. But Arrian says, "But he passed over the river Indus, and there again Alexander burnt

are speaking of is upon the confines of Turkestan. Egypt, far more remote, was conquered by Tartars, 2150 B. C.

\* These Mousikanoi are not to be confounded with the Moosa Khaun of Sind, on the Indus, who was most probably also an Afghan prince. The Afghans having always when they increased in power, subjected Sind to their rule.

† Aukna, in Panjaubi, to speak.



incense as was his custom ; and having refreshed at the Indus came to Taxila, a large and wealthy city, the greatest of those between the Indus and Hydaspes," &c. "And there again Alexander burnt incense in Taxila, as was his custom, and instituted gymnasia and horse races, &c. but having sent back Koinos's son, Polemocrat, to the river Indus that he might break up the boats, &c."

No one reading these passages can resist the conviction, that Alexander marched from the ferry of the Indus to Taxila. Strabo does not indicate the position of Taxila, saying only that "the Macedonians in the spring descended from the mountains of the Musikani to the plains and to Taxila, a large city." Pliny does not mention the city, but mentions the people Taxila beyond the river Indus. Plutarch, in his life of Alexander, mentions only the country of Taxiles as being the most fertile, abounding in excellent pasture, and described by some as equal in extent to Egypt. Chuch is celebrated for its fertility, the Indus formerly abounded in islands covered with pasture and with forests, and the Dunni district is still celebrated for its breed of horses.

In searching for the lost Taxila I found upon the right bank of the river Hurroh, N. West of Hussun Ubdal, the ruins of a town of which the name seems to be wholly lost. It is called now, like many other deserted sites, Kolia, or the ruins. It stood upon the old\* high road from Rawalpindi to Atuk ; a road which for many years has been closed by the depredations of the Tarkhailis of Gundgurb, through the skirt of which mountain the road was led. The site is very cheerful on the high bank overhanging the river. The size of this town may have been about that of Hussun Ubdal. The stones of the old building have been used to build some modern huts and Takhias. One of these has an inscription, a copy of which is appended. It is possible that with leisure I may be able to recover some more of the characters, traces of which are visible in a level light. There is little to induce the belief that this was a Greek town. It might however have been Taxila, which was not Greek, although it received a Macedonian garrison. It still belongs to the Tarkhaili clan.

\* A road much more direct than the present and saving a detour of about ten miles. This road might be reopened at little expense. I brought my laden camels through it.





*On Dust Whirlwinds and Cyclones. By P. F. H. BADDELY, Esq.  
M.D.; B. Arty. Lahore.*

“Who holds the furious storms in straiten’d reins,  
And bids fierce Whirlwinds wheel his rapid car?”

YOUNG.

(Continued from page 147.)

The Cyclone Compass, invented during the early part of December last, is intended to facilitate navigation in rotatory storms or Hurricanes.

The principle of its construction, is similar to that of the transparent Hurricane cards, invented by Sir William Reid, now in general use.

The chief advantage supposed to be connected with the Compass, is the facility with which it may be used even by persons unacquainted with the Law of Storms; a mere glance at the Compass, in whatever way placed, being sufficient to discover the bearing of the centre, and the ship’s relative position, in a Hurricane.

One instrument answers for both Hemispheres, and as it carries a magnet, which points North and South, it may serve for a compass to steer by—and by a slight modification of the present ship’s Compass, it may be made to combine both uses in the same instrument. Pl. 1.

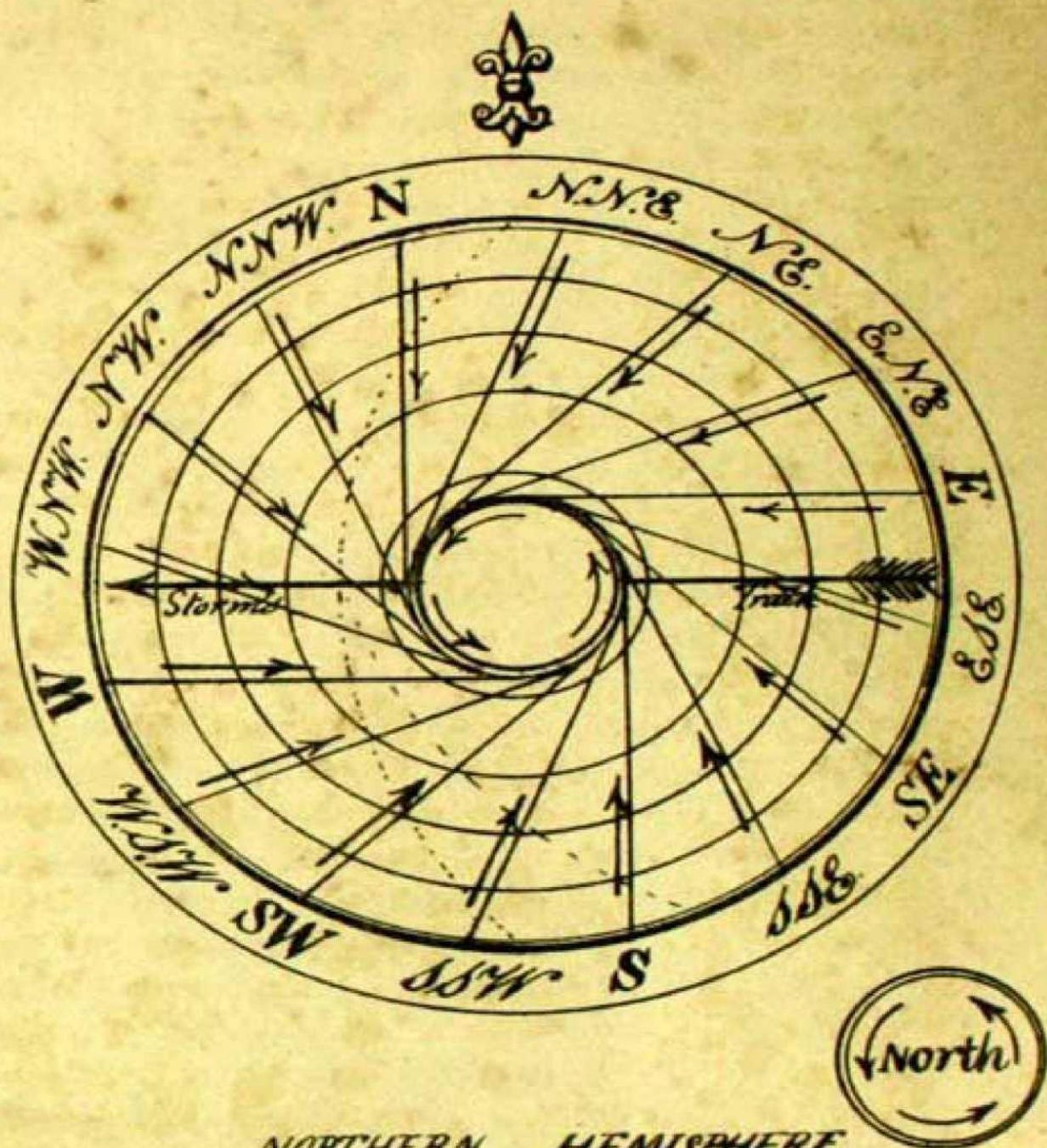
Another important advantage, is the rotatory and progressive motions that may be imparted to it, similar, it is believed, to the movements of the Cyclones themselves—by which means, the exact position and veerings of the winds all round the storm’s circuit, may be accurately noted, and transferred to paper.

So that by its use, a more precise comprehension of the character of these rotatory storms may be acquired, and their study rendered interesting, by the probability that the nature of the laws that regulate them, hitherto apparently so complicated and inexplicable, may, by the new light thrown upon them, be better understood.

The accompanying plates 7 and 8 of Cyclone courses, are intended to shew what the instrument is capable of effecting, and that by its means Cyclone courses for every point in the compass, in the Northern and Southern Hemispheres, may without difficulty be drawn for the purpose of being used as charts of reference.

The motions of the sea, may likewise, by its means be studied with equal facility and interest. Vide Plates 9 and 10.





P. Baddley.

### Storm Card.

The outer rim indicates the Wind points corresponding with the Compass points the centre transparent circle composed of centripetal tangent lines, represents the direction of the winds surrounding a Cyclone in the Northern Hemisphere and is intended to revolve on a Centre, so as to admit of being set to the direction of the Storm's track, by means of the arrow.

The centre curved arrows, mark the rotation of the Electrical Zone or body of the Cyclone.

The Dotted line marks the comparative strength and duration of the centripetal winds on either side of the Storm's track.

For the South, this is all reversed.





Description and use of the Cyclone Compass, Plates 5 and 6.

The Magnetic points north and south, and carries a light metal disk of Palladium, or other metal, marked with the *wind points*, and capable of being shifted and reversed for the northern and southern hemispheres; by which arrangement, the wind points, are always preserved in their respective positions. The disk is also grooved, for the purpose of being adjusted to the magnetic declination.

The transparent disk placed below this, with a metal rim, represents the body or zone of the Cyclone, and is marked with dotted radii or with thin wires, corresponding to the wind points, which also indicate the ship's place and the bearing of the centre; all which is understood by simply noticing the direction of the wind blowing at the time.

For instance, in a storm in the Northern Hemisphere with the wind at *South-East*, the bearing of the centre will be seen at a glance, to the *South-West*; with the wind at *South*, the bearing of the centre will be *West*.

For the Southern Hemisphere with the wind at *South-East*, the bearing of the centre will be *North-East*; and with the wind at *South*, the bearing of the centre will be *East*.

The transparent disk is fixed to a small cylinder, round which a piece of thread is wound from right to left, if required for the Northern Hemisphere; and from left to right, for the Southern.

The rim carries a pencil, or a pointed glass tube for ink, when required to mark a course on paper.

Placing the Cyclone Compass over the ship's place dotted on a Chart laid perfectly flat on a table, and then pulling very gently on the thread in a supposed track, the peculiar motions of the Cyclone, as I understand it, both progressive and rotatory, will be exactly imitated, and the veering of the winds, and the direction in which the sea is propelled by them in different parts of the space over which the influence of the Storm extends for the time, may be satisfactorily and clearly demonstrated, as in the accompanying diagrams.

Opposite points on the rim of the transparent disk, will then be found to mark on one side a gentle curve, on the other a loop.

On the side of progression, while the Cyclone Compass sweeps a gentle curve, describing a small arc of a large circle, on the opposite or looped side, it will have passed over a semi-circle of small diameter.



The looped side of a Cyclone, is the one to be avoided ; for it is in this portion of the storm, that the chief danger lies from the vortex and recurving of the storm, and the violent squalls and tumultuous seas. It is a question of the utmost importance to determine its particular position at any given time, as a knowledge of that would indicate the track of the storm, just as the track would shew the position of the loops, as may be observed in the diagram of Storm tracks for the Northern and Southern Hemispheres, Plate 11.

The Cyclone Compass, is adapted for both Hemispheres ; for by removing the magnet and reversing the *wind-point disk*, and winding the thread round the cylinder in a contrary direction, as before explained, the change from one to the other Hemisphere is effected at once.

The peculiar curve of the Storm as delineated by the Cyclone Compass, together with certain unvarying indications of the approach of the dangerous vortex, such as a falling Barometer, rapidly veering wind, fierce squalls, cross seas, &c., may, to one acquainted with navigation, and the science of the Law of Storms, suggest rules, by which the exact position of the danger may at all times be determined and avoided.

A Hurricane, I have reason to believe from investigations into the nature of Dust Storms, is caused by a mass of Electro-magnetic rotating spirals, descending from the sky to the earth, and in conformity with a general spiral motion of its own, sweeping a Cyclonal course on the earth's surface, usually in some track.

The body of such a storm is, I conceive, made up of a band of cylindrical beams or spirals moving with the storm, either singly, or in fasciculi, composing zones of all sizes, whirling their Cycloidal courses, while every separate beam or spiral rotates independently as it goes along.

The passage of the electrical spiral through the air, sets it in motion, and causes a wind to blow in the direction of its track, with more or less velocity ; depending, seemingly, upon the rapidity of the passage and the tension of the electrical spiral itself.

These spirals are I believe the exciting cause of wind in all storms, and of the gusts or squalls in particular—and of *wind generally during the day time*, in Tropical climates.



It seems probable, that the entire zone of a Cyclone is not equally charged at the same instant, nor throughout its whole extent, with the electrical spirals; but that on the side of progression they are diffused or spread out, so as to occupy a large extent of surface; while on the looped side, or vortex of the Storm, there is a rapid convergence and concentration of them, accompanied with increased intensity of action, where conflicting winds and waves meeting, will, on the laws of interferences, destroy or counteract each other's effects—accounting for many strange phenomena, well known to sailors, observable in that quarter of the storm.

The marked fall of the Barometer as the vortex is approached may, possibly, be accounted for by the upward whirling motion imparted to the air, by the action of the electrical spirals, which thereabouts, are presumed to be highly concentrated; and the *modus operandi* may be thus explained.

The electrical spiral rotating and working like a screw, from above downwards, sets in motion by its centrifugal action a stratum of air immediately surrounding it—outside this again, another circle of winds will be found blowing centripetally; and the two meeting will, by their mutual action and reaction, continuous throughout, form an ascending spiral current of air, working a reversed spiral upwards, the two motions being well represented by two coils of wire wound in opposite directions laid one over the other.

At the outer verge of the side of progression, and at the tail of the Storm, where the electrical spirals may be presumed to be in a great measure absent, and the up-current consequently less, the Barometer is reported to stand much higher, than it does elsewhere in the body of the storm—the winds thereabouts being centripetal winds, blowing with more or less obliquity in the direction of the Storm's track, and caused by its action upon the air through which it has passed, as is the case in smaller whirlwinds.

This peculiar upward working spiral motion is, I think, the cause of the ascent of dust, in whirlwinds passing over a dry sandy soil, and of the ascent of water also in water spouts.

The size and form of the ultimate spiral seems to be always the same, and is about 12 inches in diameter and cylindrical; but its energy appears to suffer increase and diminution, attributable, perhaps, to the amount of electricity with which it happens to be charged.



Their rotatory actions seem to be continuous above as far as the eye can reach; and the cloud of dust carried up by them, is observed even at the height of some thousand feet, to possess the gyratory motion, similar to what is seen at the margin of cottony masses of Cumulo-Stratus on a clear sky; which rotatory motion of the cloud, may be due to the very same cause.

The enormous height to which the dust ascends, may without much stretch of imagination, satisfactorily account for the occasional fall of dust, containing microscopic animalcula.

The dust has doubtless been transported from its original bed by whirlwinds, sweeping over land once under water, now dry; carrying up into the higher regions of the atmosphere, the lighter portions of the soil, containing these microscopic remains—this seems to offer a simple solution of the enigma.

But it is a more curious question, what becomes of the enormous amount of dust, which over a broad band of the earth's surface, far beyond the limits of the ecliptic, is continually being whirled up into the higher regions of the atmosphere by these whirlwinds.

The cause of the storm wave, and the storm current, (which as Mr. Piddington observes in his *Sailor's Horn Book*, page 151,) "are produced by the forces of the various winds blowing round in the area of the Cyclone" will be readily understood by the tangent lines marking the progression of the sea, and the veering of the winds, Pl. 9 and 10.

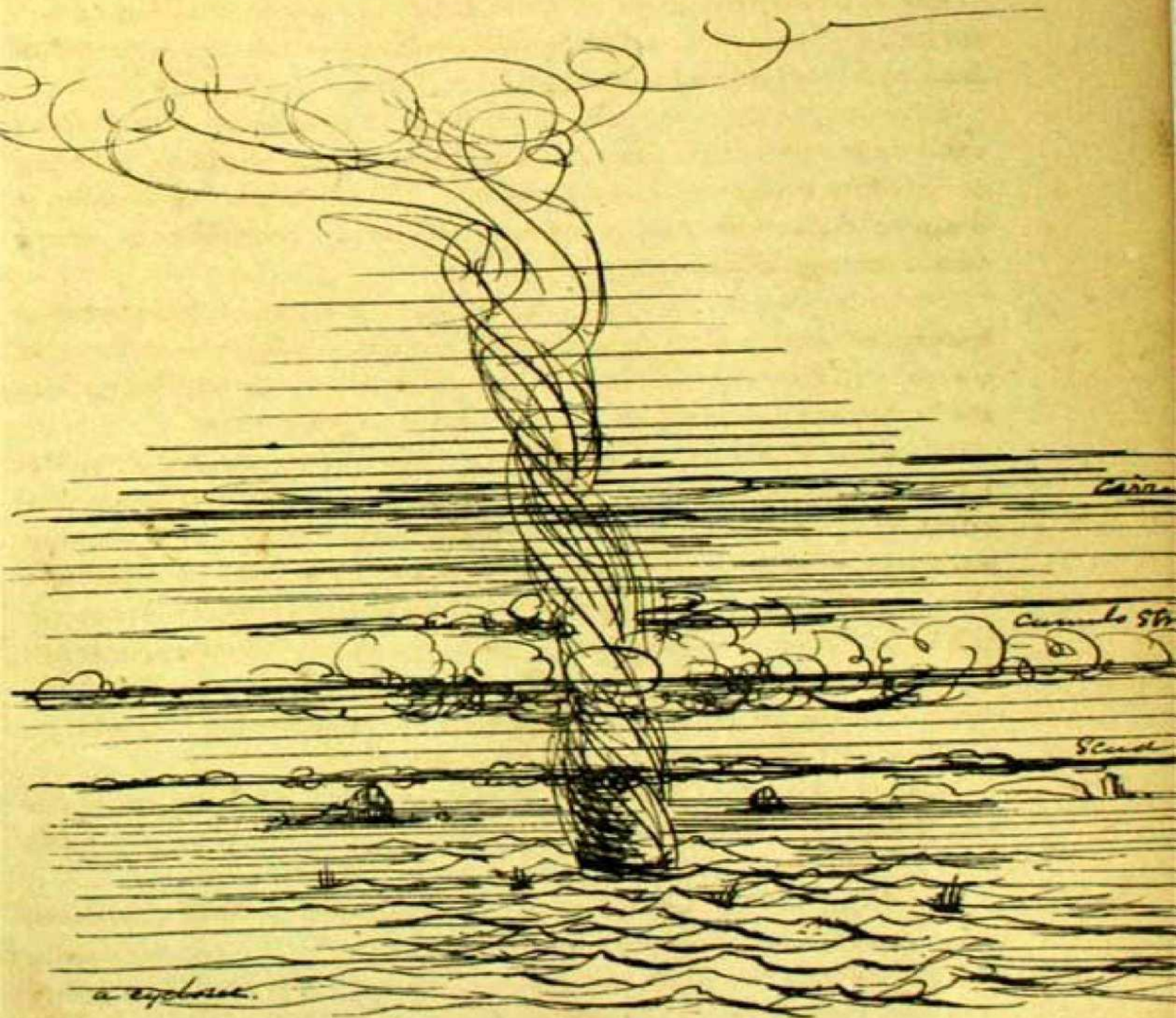
The storm wave corresponding with the side of progression, must, I should think, generally be impelled to a distance in advance of the storm and give, as is said it frequently does, more timely notice of its existence and of its track than the Barometer.

The forces on that side (the side of progression) being of longer duration in one direction, and not counteracted by opposing winds and waves, as on the looped side of the storm.

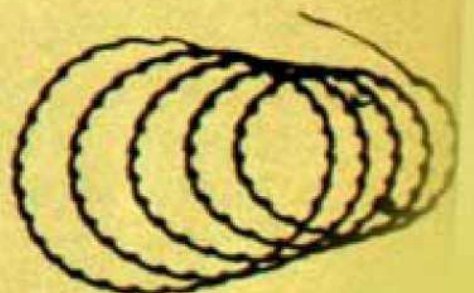
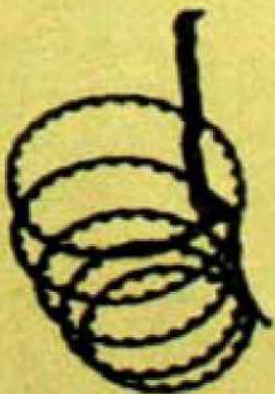
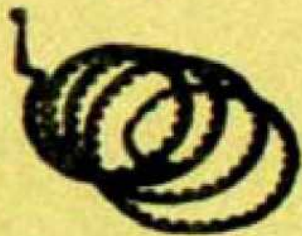
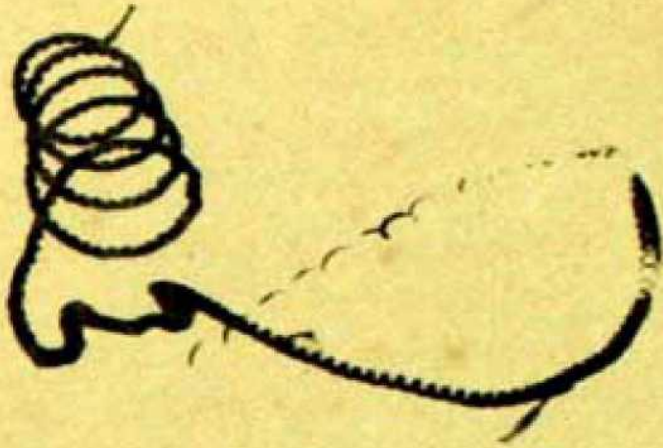
As regards the reality of the spirals, I may remark, that their existence is not a matter of theory, but of fact, which I have repeatedly verified by observation, and have actually seen them most distinctly when rendered slightly opaque by fine dust; and there is no doubt in my mind, that they are permanent, and of a peculiar nature; and though I name them Electro-magnetic, my reasons for doing so, is in consequence of certain electrical phenomena usually attending them, and for want of a better name.



Pl. N<sup>o</sup> VIII.









The Aurora Borealis and Australis seen at the poles, may be due to an accumulation of the Electro-magnetic spirals circulating in the upper regions of the atmosphere at these particular points; and the ether, supposed to pervade space, may also be composed of this substance.

An illustration of the opposite rotations in the two hemispheres, which may possibly lead to the discovery of the laws themselves, seems to be afforded by the motion of fluids.

A body moved through water, from A to B, with moderate velocity, causes two eddies in the fluid, revolving in opposite directions, and progressing on either side of the line of motion, with a tendency as they advance, to be deflected from the line parallel to the line of motion, and to assume parabolic curves, as described in Plate 12. We have here three things: a fluid,—a motion imparted to it in a certain direction,—and a resisting medium: the result being opposite movements in the fluid; seemingly of the very character of those which influence the motion of the Cyclones.

Corresponding to these, there is the atmosphere;—the centrifugal action of the earth's rotation from west to east, greatest at the Equator, and uniform only on that line;—and thirdly, the earth's translation, or the impetus with which it is carried forward, in space, re-acting and producing the effect of a resisting medium. The very conditions requisite, perhaps, for giving these peculiar motions to the air at a certain height, and for communicating the same to matter of which the whirlwinds are said to be composed.

The eddies so formed, being diverted downwards to the earth's surface, just as we observe, under certain circumstances, the like motions in water, continued downwards beneath the surface; and once formed, these rotatory movements will continue, till friction or other counter-acting effects cause their cessation.

Cyclones may be the means by which accumulated electricity in the atmosphere is gradually discharged, and they may thus become powerful means by which evaporation on a large scale is effected, and rain produced, and the Electro-magnetic spirals, having discharged their electricity and water, may be again lifted up to the higher regions of the atmosphere.



*A Table of Analyses of Indian Coals; continued from that by Mr. Jas. PRINSEP, (in Vol. VII. of Journal, p. 197) to the close of Vol. XIX. for 1850; and including Dr. McCLELLAND's Table in p. 73 of Coal Committee's Report No. II.—*

*By HENRY PIDDINGTON, Curator, Museum of Economic Geology.*

No.*	Journal and C. Com. Report.	Locality and Analyst.	Quality.	Sp. Gravity.	Water per cent.	In 100 Parts.			Per cent. of Ash in Coke.
						Volatile Matter.	Carbon	Ash.	
77	J. Vol. VII. p. 706.	Mergui. Jas. Prinsep.	Lignites sent by Dr. Helfer No. 1	1.256	10.0	55.7	36.0	7.3	
			2	1.376	9.3	53.9	37.3	8.8	
			3	1.391	7.3	3.86	43.8	17.6	
		Ditto, Ditto.	Pitch Coal ditto No. 1	1.273	9.7	45.0	50.3	4.7	
			rich flaming coal and close grained coke.						
			Ditto ditto	1.280	8.2	48.9	46.7	4.4	
			Ditto ditto	1.245	7.4	48.3	45.1	6.6	
			Ditto ditto	1.251	7.6	48.2	48.7	3.1	
			Ditto ditto	1.302	..	48.9	47.7	3.4	
			Very ligneous.	1.244	..	39.9	58.1	2.0	
			More compact coal.	1.392	..	50.0†	40.9	5.1	
			....	1.177	..	42.8	54.6	2.6	
			Cannel coal.						
78	C. C. R. Part I. Sec. VII. page 5.	Namroop Coal No. 1. Ditto.							
79	....	No. 2. Ditto.							
80	page 12.	Chilmaree, McClelland.							
81	C. C. R. IV. p. 180.	Moulmein, Mr. Blundell, McClelland.							

\* The numbers are continued from Mr. Jas. Prinsep's Table, and I add to the present one a column of references to the Vol. and page of Journal, or Coal Committee's Reports, where the Analysis will be found, and the name of the Analyst, where given. Mr. Prinsep's Table goes to No. 59, and 17 more Analyses are added of imported coals, numbered 1 to 17, so that I have taken 76, as his last No. and 77, as our first.

† Including water.



*Analyses of Indian Coals—Continued.*

No.	Journal and C. Com. Report.	Locality and Analyst.	Quality.	Sp. Gravity.	Water per cent.	In 100 Parts.			Per cent. of Ash in Coke.
						Volatile Matter.	Carbon.	Ash.	
82	C. C. R. IV. p. 180.	Hoong; South of Ramree 6 miles, Capt. Bogle, <i>McClelland</i> .	Caking Coal,.....	1.32	7.6	36.	49.	15.	
83	....	Tyoo Ghat, Assam, Capt. Jen- kins, <i>McC</i> .	Ditto,.....	1.3	..	40.	55.	5.	
84	....	Palamow Mirall, Mr. Tytler, <i>McC</i> .	Slate Coal,.....	1.26	..	44.	50.	6.	
85	....	Palamow, ditto, <i>McC</i> .	Slaty, Crop Coal,.....	1.48	..	32.	58.	10.	
86	....	Ditto Singra, ditto, <i>McC</i> .	Ditto,.....	1.2	..	25.	63.	12.	
87	....	Mergui, Lt. Hutchinson, <i>McC</i> .	Caking Coal, excellent,.....	1.27	..	55.	40.	5.	
88	....	Byrung Ponjje, Sylhet; Major Lister, <i>McC</i> .	Ditto,.....	1.3	..	34.	64.5	1.5	
89	....	Ditto, variety, ditto, <i>McC</i> .	Slaty, inferior, .....	1.4	..	25.	29.	46.	
90	....	Ditto, ditto, <i>McC</i> .	Surface Coal,.....	..	..	30.	50.	20.	
91	....	Ditto, a different sample, ditto, <i>McC</i> .	Caking Coal,.....	1.3	..	51.	42.	7.	
92	....	Chuppra, on the Soane, Mr. Ra- venshaw <i>McC</i> .	Slate Coal, mixed, .....	1.5	..	32.	57.5	10.5	
93	....	Borneo, Capt. Johnston, <i>McC</i> .	Ditto, excellent, .....	1.27	..	59.6	34.	6.4	
94	....	Borbath, Assam, Lt. Strong, <i>McC</i> .	Caking Coal, ditto, .....	1.2	..	45.	52.7	2.3	
95	....	Borbath, another bed, Lt. Strong, <i>McC</i> .	Cannel Coal, excellent,.....	1.28	..	44.	48.	8.	
96	....	Cheduba, Arracan, Capt. Bogle, <i>McC</i> .	Ditto, inferior, .....	1.30	..	46.8	41.2	12.	



## Analyses of Indian Coals—Continued.

No.	Journal and C. Com. Report.	Locality and Analyst.	Quality.	Sp. Gravity.	Water per cent.	In 100 Parts.			Per cent. of Ash in Coke.
						Volatile Matter.	Carbon.	Ash.	
97	C. C. R. IV. p. 180.	Khota, Singrowly, Capt. Wroughton, McClelland.	Middling, .....	1.29	7.6	54.	32.2	13.8	
98	....	Jubbulpore, Dr. Spilsbury, McC.	Excellent, .....	1.49	..	50.	47.1	2.9	
99	....	Near Dearee, the Soane, Mr. Ravenshaw, McC.	Middling, .....	1.42	..	37.6	58.1	4.3	
100	....	Quillimané, (Cape) S. Africa, ditto.	Surface Coal, .....	1.6	..	23.2	40.16	36.6	
101	....	Tavoy River, Mr. Blundell, McC.	Cannel Coal, .....	1.72	..	62.	28.26	9.74	
102	....	Chittagong or Tipperah Hill, Mr. Seonce, McC.	Good Slaty Coal, .....	1.375	..	64.6	24.4	11.	
103	....	Petchelee Gulf, received thro' Capt. Johnston, McC.	Anthracite, .....	1.71	..	20.	74.	6.	
104	....	Doobradgapore, Mr. Jas. Pontet, McC.	Inferior Slaty Coal, .....	1.4	..	42.	33.	20.	
105	....	Jeypore, Upper Assam, Mr. F. R. Hampton, McC.	Superior, .....	1.3	..	48.	46.2	5.8	
106	....	Pulo Chermin, Borneo, Marine Board, McC.	Very superior, .....	1.34	..	64.	32.5	3.5	
107	....	Pulo Keng, Arrang, Borneo, ditto, McC.	Inferior, .....	1.39	..	43.	30.5	26.5	
108	....	Bikrampore, Cachar, Capt. Guthrie, McC.	Superior, .....	1.3	..	64.8	33.2	2.	



*Analyses of Indian Coals—Continued.*

No.	Journal and C. Com. Report.	Locality and Analyst.	Quality.	Sp. Gravity.	Water per cent.	In 100 Parts.			Per cent. of Ash in Coke.
						Volatile Matter.	Carbon.	Ash.	
109	C. C. R. IV. p. 180.	Gudada River, Dhubary, Mr. J. Bedford, <i>McClelland</i> .	Inferior,.....	1.4	7.6	57.4	24.6	18.	
110	....	Bunarosee Caribari Hills, ditto, <i>McC.</i>	Brown Coal, burns freely, ....	1.4	..	50.	40.6	9.4	
111	....	Mirampara, or Balajora Caribari Hills, ditto, <i>McC.</i>	Ditto,.....	1.2	..	64.	26.	10.	
112	....	Salkora Caribari Hills, ditto, <i>McC.</i>	Good Brown Coal, ..... {	1.3 to 1.4	..	70.	25.4	4.6	
113	....	New Mine? Burdwan? Major Henderson, <i>McC.</i>	Superior, ..... {	1.3	..	36.	60.	4.	
114	....	Shanghai, (China,) Dr. G. Playfair, <i>McC.</i>	Very superior, ..... {	1.29	..	33.6	64.	2.4	
115	....	Near the falls of the Jumooona, (Assam,) Major Jenkins, <i>McC.</i>	Without exception the best specimen of Coal on the list, <i>McC.</i>	1.2	..	46.	53.4	.6	
116	....	The bed of the Terro Nuddee, (Assam,) ditto, <i>McC.</i>	Superior, ..... {	1.3	..	62.	35.4	2.8	
117	....	{ a } Nicobar Island, Messrs Mac- b } key and Co. <i>McC.</i> c }	Weathered specimen, ..... {	1.3 1.3 1.3	..	61.4 57. 49.	34.2 40. 46.	4.4 3. 5.	
118	....	Dikho, (Assam,) Capt. Rogers, <i>McC.</i>	Most superior, ..... {	1.3	..	28.	66.	.6	
119	....	Dikho, tributary of the Jumooona, 8 miles above the falls, Messrs Masters and Wood, <i>McC.</i>	A dull Earthy Coal, ..... {	1.3	..	44.6	38.8	16.6	



## Analyses of Indian Coals—Continued.

No.	Journal and C. Com. Report.	Locality and Analyst.	Quality.	Sp. Gravity.	Water per cent.	In 100 Parts.			Per cent. of Ash in Coke.
						Volatile Matter.	Carbon.	Ash.	
120	C. C. R. IV. p. 180.	Badam, Col. Onseley, McClell. land.	Very superior, .....	1.29	7.6	32.00	60.00	8.00	
121	....	Jubbulpore, Lieut.-Col. Cox, McC.	Good, .....	1.31	..	27.00	61.00	12.00	
122	Vol. XIV. p. 34	Supposed Assam, Piddington.	Cannel Coal, .....	1.3	..	59.00	37.00	4.00	
123	XVI. 371	Kyook Phyo, Pid.	Poor silicious Lignite, .....	1.34	12.00	26.40	31.60	29.20	
124	XVII. 59	Burdwan, Pid.	Volcanic Coal, .....	1.28	1.00	18.90	63.60	16.50	
125	.... 168	Assam, Bootee Dehing, Pid.	Ball Coal, .....	1.37	5.00	29.00	57.00	9.00	
126	XVIII. 170	Prisco Pit, Newport, S. Wales, Pid.	Cannel Coal, .....	1.31	5.50	28.00	56.50	10.00	
127	.... —	Ditto, Pid.	Highly pyritous Coal, which ig- nited spontaneously, .....	1.29	2.25	24.50	69.00	4.75	Saline 4.35
128	.... 412	Burdwan, Pid.	Top Coal of the same, ....	..	1.65	14.17	44.18	37.82	
129	XIX. 75	Ditto, Pid.	Matrix Coal of Ball Coal, ....	1.26	3.90	18.90	61.75	16.25	
130	.... —	Ditto, Pid.	Ditto ditto, .....	1.34	..	28.00	59.60	12.40	
131	.... 156	Labuan, Pid.	Ball Coal, .....	1.32	..	24.00	68.75	7.25	
			Bituminous Coal, .....	1.27	..	36.50	61.35	2.15	



PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.

MARCH, 1852.

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The usual monthly meeting of the Society was held on the 3rd instant, at half-past 8 P. M.

J. R. COLVIN, Esq., Senior Member of the Council, present, in the Chair.

The proceedings of the last meeting were read and confirmed.

An ancient Hindu silver coin found in a chattee of common earthenware at Nagpore, and four Bactrian copper coins, were presented to the Society by Dr. J. Grant.

Sir H. M. Elliot presented eight Mohammedan silver coins for the Society's cabinet. (They have been described in the last Number of the Journal, No. 7 of 1851.)

A very interesting native picture by a Burmese artist, formerly attached to the Royal Court at Ava, was presented by Dr. A. Thomas of Ramree, through Capt. Sparks. The subject of the picture is thus described by Dr. Thomas :

" On one side of the picture is represented the Royal Palace and the Royal Monastery ; the priests in their sacerdotal garb, and the White Elephant are all shown. On the other side is a grand procession, showing that a lad is about to enter the order of Priesthood. This picture while it affords us some partial insight into the rites and ceremonies of the Burmese religion, shows also what the artistic powers of a semi-civilized nation are."

The following report was submitted to the meeting by the Council :—



The Council having had under their consideration a proposal of Dr. A. Sprenger to print in the *Bibliotheca Indica* the following works : namely ;—Hadykah, a Persian Poem, by Sanay, to be edited by Agha Mohammed Shoostry and Dr. A. Sprenger ; the *Hayát al Haywán* of Damyry, to be edited by Moulovie Mohammed Wajyh ; and the *Itqán* of Suyúty to be edited by Moulovies Busheerooddeen and Núrul Hakk ; recommend that the offer be accepted and these works be printed in the *Bibliotheca*. A full account of these works will be given in the preface of each work agreeably to the resolution of the Society of the 5th December, 1851.

Bábu Gyanendro Mohun Tagore, duly proposed and seconded at the last meeting, was balloted for and elected an ordinary member.

W. Lees, Lieut., N. I., was proposed as an ordinary member of the Society by J. R. Colvin, Esq., and seconded by Dr. A. Sprenger.

Communications were received :—

1st.—From B. H. Hodgson, Esq., communicating a valuable paper entitled “ On the Indo-Chinese hordes and their connexion with the Himalayans and Thibetans.”

With reference to Mr. Hodgson’s request for the loan of Klaproth’s *Asia Polyglotta* and Adelung’s *Mithridates*, the Rev. Mr. Kay promised to send the first named book to Mr. Hodgson.

2nd.—From Rev. J. Long—An Analysis of the *Raghu Vansa*.

3rd.—From Capt. Layard, through Capt. Thuillier, fac-simile of an Arabic inscription from *Rájmahal*.

4th.—From the same, in continuation of his letter received last month, with reference to his researches into the ruins of Gour, and enclosing a paper entitled “ Nooks and Corners of India, No. 1.”

The following is an extract from Capt. Layard’s letter :—

“ My short visit to Gour has been one of much interest to me, although from being obliged to return to the duties of my office I was unable to complete my sketches and enquiries in the southern suburbs of the city near Chandnee. I was fortunately able to visit the whole of the northern portion of the ruins as far as Gungerampore on the banks of the Kalindree, which I take to be the most ancient part of the city, or rather *the* Gour of the Hindus, previous to the invasion of the Mussalman conqueror Mahommed Bukhtyar. Besides sketches of all the ruins, I have taken drawings of many remains of architec-



ture, of columns, cornices, friezes, &c., scattered about the jungles and built into mosques, &c., also of many ancient and curious sculptures which, with the kind assistance of Mr. Gray, of Goamutty, I have been able to collect. Owing to the weight of the stones I have left all at Goamutty, for transport to Berhampore during the rains, deferring their transit to the Society's Museum until I learn from you whether they would be acceptable to the Society or not; otherwise Mr. Gray concurs with me in my intention of presenting them to the British Museum.

"The principal sculpture I have to offer now, consists of a very beautifully carved image of Soorya highly relieved and surrounded by numerous smaller figures, standing on the car drawn by the seven coursers of the Sun driven by Arun: the height of the principal figure is about  $2\frac{1}{2}$  feet.

"Coleman, in his mythology of the Hindus gives a description of Soorya, and drawing of an image at Benares (if I remember right), but this sculpture which I was fortunate enough to find in the jungle near Gungerampore, appears to be far superior, and much more elaborately ornamented than that described by Coleman, or even those mentioned in Buchanan Hamilton's work. Next to this stone, I must mention one found by Mr. Gray, which represents a female figure lying on a richly ornamented couch with an infant by its side, the lady is being shampooed by a female attendant. There are several other figures on the stone and amongst them a row of presiding Deities on the upper portion. The whole is beautifully carved in very high relief and slightly mutilated. I have another portion of a stone representing the same scene as the above, but very much smaller, and so much destroyed by having been cut up, that it is not worth offering to the Museum. There are several other sculptures more or less ancient and curious, which I can describe hereafter, whenever they reach from Goamutty.

"I have taken impression on cloth of all inscriptions lying about the jungles or fixed on the mosques, which I will at leisure try to decipher or send to you to have deciphered in Calcutta, or bring them down with me hereafter if I can get leave of absence for a few days. There are also some copper coins which I was fortunate enough to pick up (mostly from coolies who dig for bricks) and which may lead





to some information regarding the sketches of Gour. You are at liberty to make the subject of my letter known to the Asiatic Society but it has been written hurriedly and in the midst of much office work, and therefore I fear not over-explicit."

5th.—A letter was read from Mr. Bayley, stating that he had seen the figure of the Jupiter in the Society's possession and had a duplicate of it, which was somewhat imperfect. He further stated that want of time will prevent his finishing his note on Bactrian Antiquities, asked for by the Society for some time, but that on his return to Kote Kangra he will be able to send it to the Society, when he will also send a notice of four new Bactrian coins.

The Chairman read a letter from the Secretary to the Government of India forwarding in compliance with the wish of Major Kittoe a collection of sculpture for exhibition to the members of the Society; and then proposed that it be referred to the Council to consider and report as to the desirableness of securing fac-similes or engravings of either of the inscriptions or figures for the purposes of the Society and on the probable cost at which that object could be carried out. The motion having been seconded by Mr. Heatly was carried *nem. con.*

*Confirmed 7th April 1852.*

(Signed) J. W. COLVILLE.

The Librarian submitted the following list of books added to the Library since the last meeting.

*Presented.*

The Sandhya or the daily Prayers of the Brahmans illustrated in a series of Original Drawings. By Mrs. S. C. Belnos.—PRESENTED BY THE GOVERNMENT OF BENGAL.

The Journal of the Indian Archipelago for December, 1851.—BY THE EDITOR.

Smithsonian Contributions to Knowledge, Vol. III.—PRESENTED BY THE SMITHSONIAN INSTITUTION, WASHINGTON.

Fourth Annual Report of the Board of Regents of the Smithsonian Institution for the year 1849.—BY THE SAME.

Report to the Smithsonian Institution on the History of the Discovery of Neptune. By Benjamin A. Gould, Jr., 8vo. Pamphlet.—BY THE SAME.

Notices of the Public Libraries in the United States of America. By Charles C. Jewett, Washington, 1851, 8vo. Pamphlet.—BY THE SAME.





Proceedings of the American Association for the Advancement of Science. Fourth meeting held at the Haven, August 1850. Washington, 1851, 8vo.—BY THE SAME.

Historical and Statistical Information respecting the History, condition and prospects of the Indian Tribes of the United States. Collected and prepared under the direction of the Bureau of Indian affairs per Act of Congress of March 3rd 1847.—By Henry R. Schoolcraft, Part I. Philadelphia, 1851. PRESENTED BY L. LEA, ESQ.

Recueil des Actes de L'Académie des Sciences, Belles Lettres et Arts de Bordeaux. Treizième année 1851, 1st Tremestre.—BY THE ACADEMY.

The Oriental Christian Spectator, for January, 1852.—BY THE EDITOR.

The Oriental Baptist, for March, 1852.—BY THE EDITOR.

The Calcutta Christian Observer for March, 1852.—BY THE EDITORS.

The Upadeshak No. 63.—BY THE EDITOR.

Satyárnab for December, 1851, January and February, 1852.—BY THE REV. J. LONG.

The Bengali Instructor, No. 4.—BY THE SAME.

Tattwabodhiní Patriká, No. 103.—BY THE TATTWABODHINI' SHABHA'.

The relation of the mind to external objects (Bengali,) Part I. By Bábu Akshayakumára Datta.—BY THE AUTHOR.

The Missionary for February, 1852.—BY THE EDITOR.

The Benares Magazine, No. 31.—BY THE EDITOR.

Report of the Calcutta Public Library for 1851.—BY THE CURATORS OF THE LIBRARY.

The Purnachandrodaya, a Bengali Newspaper, for February, 1852.—BY THE EDITOR.

The Citizen, for February, 1852.—BY THE EDITOR.

The Indian Charter, for February, 1852.—BY THE EDITOR.

*Purchased.*

Comptes Rendus, Nos. 15 to 21, for 1851.

Journal des Savants for October, 1851.

Annals and Magazine of Natural History for December, 1851.

*Presented*



# Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of March, 1852.



Observations made at Sun-rise.										Maximum Pressure observed at 9 h. 50 m.										Observations made at Apparent Noon.										
Temperature.					Wind.		Aspect of Sky.			Temperature.					Wind.		Aspect of Sky.			Temperature.					Wind.		Aspect of Sky.			
Bar. red. to 32° F.	Of Mer.	Of Air.	W. Bulb.	Direction at Sun-rise.	At Noon.	At Noon.	Of Mer.	Of Air.	W. Bulb.	Direction at 9h 50m.	At 9h 50m.	At Noon.	Of Mer.	Of Air.	W. Bulb.	Direction at Noon.	At Noon.	At Noon.	Of Mer.	Of Air.	W. Bulb.	Direction at Noon.	At Noon.	At Noon.	Of Mer.	Of Air.	W. Bulb.	Direction at Noon.	At Noon.	At Noon.
Inches	°	°	°				°	°	°				°	°	°				°	°	°				°	°	°			
29.922	74.2	74.4	73.0	S. W.	Clear	Clear	78.7	81.2	76.4	S. W.	Cumuli	Cumuli	29.971	78.7	81.2	76.4	S. W.	Cumuli	Cumuli	85.3	87.4	76.6	S. S. W.	Cumuli	29.927	85.3	87.4	76.6	S. S. W.	Cumuli
.832	75.0	75.3	73.2	S. W.	Cloudy	Cloudy	80.4	82.6	75.4	S. S. W.	Clear	Clear	.881	80.4	82.6	75.4	S. S. W.	Clear	Clear	86.6	89.0	76.4	S. S. W.	Clear	.851	86.6	89.0	76.4	S. S. W.	Clear
.839	71.6	71.8	70.0	S. S. W.	Clear	Clear	79.0	81.8	77.8	S. S. W.	Cumuli	Cumuli	.905	79.0	81.8	77.8	S. S. W.	Cumuli	Cumuli	.913	82.2	82.4	N. N. E.	Cirro-strati	.866	84.0	85.3	73.2	W. N. W.	Cumuli
.847	76.6	76.6	75.4	S. W.	Ditto	Ditto	79.4	80.8	64.0	N. N. E.	Cirro-strati	Cirro-strati	.930	79.4	80.8	64.0	N. N. E.	Cirro-strati	Cirro-strati	.972	83.2	84.6	N. N. W.	Cirro-cumuli	.913	82.2	82.4	64.4	N.	Cirro-strati
.925	71.6	71.7	68.8	N. W.	Ditto	Ditto	77.4	80.0	63.3	N.	Clear	Clear	30.017	77.4	80.0	63.3	N.	Clear	Clear	.964	82.4	85.0	N. N. W.	Clear	.972	83.2	84.6	63.6	N. N. W.	Cirro-cumuli
.949	69.4	69.7	65.6	N. W.	Cirro-strati	Cirro-strati	76.3	79.3	74.2	W.	Ditto	Ditto	.008	76.3	79.3	74.2	W.	Ditto	Ditto	.928	83.0	84.6	N. W.	Cumulo-strati	.964	82.4	85.0	70.2	N. W.	Clear
.896	74.0	74.2	72.8	S.	Clear	Clear	79.5	80.4	75.4	W. S. W.	Cumulo-strati	Cumulo-strati	29.954	79.5	80.4	75.4	W. S. W.	Cumulo-strati	Cumulo-strati	.928	83.0	84.6	S. W.	Cumulo-strati	.928	83.0	84.6	75.6	S. W.	Cumulo-strati
.960	70.7	70.6	68.6	W.	Ditto	Ditto	78.3	80.6	63.4	N. W.	Clear	Clear	30.025	78.3	80.6	63.4	N. W.	Clear	Clear	.979	81.8	83.5	N. W.	Clear	.979	81.8	83.5	63.3	N. W.	Clear
.941	71.6	71.8	68.3	W.	Ditto	Ditto	77.9	80.4	72.2	W.	Ditto	Ditto	29.993	77.9	80.4	72.2	W.	Ditto	Ditto	.947	83.3	85.6	W.	Ditto	.947	83.3	85.6	67.4	N. W.	Ditto
.900	72.2	72.5	71.3	S.	Foggy	Foggy	77.0	78.8	75.4	W.	Cumuli	Cumuli	.938	77.0	78.8	75.4	W.	Cumuli	Cumuli	.868	83.2	84.6	W.	Cumuli	.868	83.2	84.6	76.0	S. S. W.	Cumuli
.848	74.3	74.5	72.8	S.	Cumuli	Cumuli	79.5	81.7	76.3	S. W.	Clear	Clear	.920	79.5	81.7	76.3	S. W.	Clear	Clear	.882	84.7	86.6	W.	Clear	.882	84.7	86.6	74.1	W. S. W.	Clear
.929	75.8	75.9	73.6	S.	Cirro-strati	Cirro-strati	81.9	83.7	75.3	S. W.	Cirro-strati	Cirro-strati	.973	81.9	83.7	75.3	S. W.	Cirro-strati	Cirro-strati	.914	86.2	87.0	S. W.	Cirro-strati	.914	86.2	87.0	77.7	S.	Cirro-strati
.867	76.2	76.3	74.0	S.	Cloudy	Cloudy	81.3	83.2	76.0	S. S. W.	Clear	Clear	.883	81.3	83.2	76.0	S. S. W.	Clear	Clear	.835	86.4	87.6	S. S. W.	Clear	.835	86.4	87.6	77.2	S.	Clear
.849	70.8	70.8	67.4	N. E.	Ditto	Ditto	76.7	79.9	75.4	S. S. E.	Cirro-strati	Cirro-strati	.877	76.7	79.9	75.4	S. S. E.	Cirro-strati	Cirro-strati	.824	83.8	84.9	S. S. E.	Cirro-strati	.824	83.8	84.9	75.9	S.	Cumuli
.901	70.6	70.4	68.7	N. N. E.	Ditto	Ditto	70.8	71.6	68.3	W. S. W.	Cumuli	Cumuli	.924	70.8	71.6	68.3	W. S. W.	Cumuli	Cumuli	.898	75.6	78.0	W. S. W.	Cumuli	.898	75.6	78.0	71.4	S. E.	Ditto
.887	72.8	72.6	71.6	S. S. W.	Clear	Clear	79.0	80.6	75.4	S. W.	Cumulo-strati	Cumulo-strati	.955	79.0	80.6	75.4	S. W.	Cumulo-strati	Cumulo-strati	.921	83.4	85.4	S. W.	Cumulo-strati	.921	83.4	85.4	77.3	S.	Cumulo-strati
.903	74.6	74.8	73.4	S. W.	Cirro-strati	Cirro-strati	78.8	80.2	76.3	S. W.	Cumulo-strati	Cumulo-strati	.963	78.8	80.2	76.3	S. W.	Cumulo-strati	Cumulo-strati	.904	83.3	84.8	W. S. W.	Cumulo-strati	.904	83.3	84.8	77.2	S. W.	Ditto
.828	72.2	72.0	68.9	S. W.	Cloudy	Cloudy	78.4	81.0	76.1	W. S. W.	Cirro-cumuli	Cirro-cumuli	.885	78.4	81.0	76.1	W. S. W.	Cirro-cumuli	Cirro-cumuli	.871	83.4	85.2	S. W.	Cumuli	.871	83.4	85.2	76.9	S. W.	Ditto
.819	72.3	72.4	71.0	S. E.	Ditto	Ditto	78.0	79.8	76.4	S. E.	Cloudy	Cloudy	.892	78.0	79.8	76.4	S. E.	Cloudy	Cloudy	.867	78.5	77.6	S. E.	Cloudy	.867	78.5	77.6	73.0	S. W.	Rain-thundering
.890	70.8	70.8	69.5	W.	Cirro-strati	Cirro-strati	77.0	79.4	74.0	S.	Cumuli	Cumuli	.960	77.0	79.4	74.0	S.	Cumuli	Cumuli	.923	81.8	83.0	S.	Cumuli	.923	81.8	83.0	74.0	S. W.	Cumuli
.890	67.4	67.0	66.0	S. E.	Cloudy	Cloudy	71.3	73.0	69.0	W. S. W.	Cirro-strati	Cirro-strati	.930	71.3	73.0	69.0	W. S. W.	Cirro-strati	Cirro-strati	.908	76.4	78.2	W. S. W.	Cirro-strati	.908	76.4	78.2	72.0	W. S. W.	Cirro-strati
.884	68.3	68.2	66.8	N. W.	Cirro-strati	Cirro-strati	72.0	73.0	69.2	W. S. W.	Cloudy	Cloudy	.952	72.0	73.0	69.2	W. S. W.	Cloudy	Cloudy	.918	76.9	79.0	W.	Cirro-strati	.918	76.9	79.0	72.0	W.	Cirro-strati
.857	68.0	68.0	66.8	S.	Ditto	Ditto	76.5	78.8	72.0	S. W.	Cumuli	Cumuli	.927	76.5	78.8	72.0	S. W.	Cumuli	Cumuli	.895	81.5	83.0	S. W.	Cumuli	.895	81.5	83.0	72.4	S. W.	Cumuli
.841	70.7	70.4	68.6	S.	Ditto	Ditto	79.3	81.8	75.3	S. S. W.	Ditto	Ditto	.888	79.3	81.8	75.3	S. S. W.	Ditto	Ditto	.848	83.3	84.2	S. S. W.	Ditto	.848	83.3	84.2	76.2	S. S. W.	Ditto
.845	69.4	69.3	68.4	S. E.	Clear	Clear	75.0	76.9	71.4	W. N. W.	Ditto	Ditto	.896	75.0	76.9	71.4	W. N. W.	Ditto	Ditto	.858	78.6	79.5	W. N. W.	Cumulo-strati	.858	78.6	79.5	72.2	N. W.	Cumulo-strati
.761	69.3	68.4	67.0	S. E.	Cloudy	Cloudy	71.0	72.0	69.0	S. S. E.	Cloudy	Cloudy	.815	71.0	72.0	69.0	S. S. E.	Cloudy	Cloudy	.787	75.3	76.3	S. S. E.	Cloudy	.787	75.3	76.3	71.0	S. W.	Cloudy
.640	69.8	69.8	68.5	S.	Ditto	Ditto	72.2	73.2	67.3	N. W.	Cumulo-strati	Cumulo-strati	.690	72.2	73.2	67.3	N. W.	Cumulo-strati	Cumulo-strati	.657	74.3	75.0	N. W.	Cumulo-strati	.657	74.3	75.0	66.1	N. W.	Cumulo-strati
.748	66.2	65.4	62.8	S. W.	Clear	Clear	74.0	75.4	65.5	W.	Clear	Clear	.837	74.0	75.4	65.5	W.	Clear	Clear	.808	78.0	79.0	W.	Clear	.808	78.0	79.0	65.6	W. N. W.	Clear
.769	68.6	68.9	65.4	S.	Cirro-strati	Cirro-strati	77.6	80.0	71.4	W. S. W.	Ditto	Ditto	.821	77.6	80.0	71.4	W. S. W.	Ditto	Ditto	.777	83.2	85.0	W. S. W.	Ditto	.777	83.2	85.0	70.0	S. W.	Ditto
.687	73.4	73.5	72.2	S. S. W.	Clear	Clear	80.0	82.5	75.6	S. S. W.	Ditto	Ditto	.737	80.0	82.5	75.6	S. S. W.	Ditto	Ditto	.696	86.4	88.0	S. S. W.	Ditto	.696	86.4	88.0	75.5	S. W.	Ditto
.730	77.5	77.7	76.0	S. W.	Ditto	Ditto	81.6	82.3	77.4	W.	Cirro-cumuli	Cirro-cumuli	.819	81.6	82.3	77.4	W.	Cirro-cumuli	Cirro-cumuli	.756	87.1	89.2	E.	Cirro-cumuli	.756	87.1	89.2	77.0	E.	Cirro-cumuli
Mean 29.851	71.8	71.8	69.9	....	.....	.....	77.3	79.2	72.6	....	.....	.....	29.909	77.3	79.2	72.6	....	.....	.....	29.870	82.0	83.5	....	.....	29.870	82.0	83.5	73.0	....	.....



# [ Meteorological Register, continued. ]

Minimum Pressure observed at 4 p. m.				Observations made at sun-set.				Maximum and Minimum Thermometer.			Rain Gauges.		Moon's Phases.	Date.					
Bar. red. to 32° F.	Of Mer.	Of Air.	W. Bulb.	Direction at 4 p. m.	Aspect of Sky.	Bar. red. to 32° F.	Of Mer.	Of Air.	W. Bulb.	Direction at Sun-set.	Aspect of Sky.	Max.			Mean.	Min.	Max. Therm.	Feet. 60. Upper	Feet. 5. Lower
Inches	°	°	°			Inches	°	°	°				°	°	°	°	Inch.		
29.827	90.3	90.4	77.8	S.	Clear	29.837	86.4	84.8	77.2	S.	Clear	91.6	82.3	73.0	106.3	..	..	1.36	
.738	89.8	89.3	76.7	S.	Ditto	.724	85.7	84.0	76.4	S. sbp.	Cloudy to W.	91.3	81.9	72.4	103.8	1.29	..	..	
.762	88.7	89.2	73.0	S. W.	Ditto	.762	86.3	84.6	76.4	W.	Clear	89.4	79.1	68.8	105.3	..	..	..	
.819	85.0	85.2	65.2	N. W.	Cirro-strati	.829	83.4	82.0	67.0	NNW	Cloudy	85.3	80.3	75.2	96.6	..	..	..	
.883	87.3	87.5	65.0	N. W.	Ditto	.873	84.8	82.8	66.2	S.	Cirro-strati	88.0	79.1	70.2	101.0	..	..	..	
.861	87.4	87.0	68.0	S.	Clear	.859	84.8	83.8	70.8	S.	Ditto	88.5	78.0	67.5	105.0	..	..	..	
.848	87.0	87.4	76.3	W.	Cumuli	.862	85.3	84.4	75.6	W.	Ditto	88.0	80.2	72.4	98.4	..	..	..	
.878	86.2	86.9	65.0	N. W.	Clear	.888	84.0	81.9	65.5	S.	Clear	86.9	78.2	69.5	102.8	..	..	..	
.843	88.5	89.0	67.4	WSW	Ditto	.832	85.0	84.0	67.9	S.	Clear	89.3	79.8	70.2	103.6	..	..	..	
.764	88.6	89.3	69.4	SS. W.	Cumuli	.734	87.0	85.0	71.2	S. E.	Ditto	89.0	80.1	71.2	103.6	..	..	..	
.786	90.6	91.3	71.2	W.	Clear	.804	87.7	86.6	73.2	S. E.	Cumuli	91.0	81.8	72.6	109.2	..	..	..	
.843	87.3	87.2	76.4	SS. W.	Cirro-strati	.848	83.8	83.0	75.8	S. E.	Cumulo-strati	89.0	81.5	74.0	102.0	..	..	..	
.757	83.7	82.6	76.4	S.	Cloudy	.816	80.8	79.7	76.7	S. W.	Cirro-strati	89.2	81.7	74.2	101.0	..	..	..	
.685	86.0	84.4	76.3	S.	Ditto	.746	82.0	78.9	73.0	NNW	Rain, Thundrg.	88.4	78.7	68.9	101.2	0.19	0.26	0.46	
.814	82.4	82.0	72.9	S.	Clear	.828	80.0	78.3	72.4	S.	Cloudy	83.0	75.1	67.2	97.4	0.40	..	..	
.829	87.4	87.0	77.4	S. S. E.	Cloudy	.837	83.4	82.4	75.7	S. S. W.	Cirro-strati	88.7	79.7	70.6	104.0	..	..	..	
.797	87.3	87.4	75.5	S.	Cirro-strati	.785	84.4	83.0	75.0	S.	Ditto	88.0	80.4	72.8	105.0	0.73	0.74	..	
.762	84.7	84.0	77.3	S. E.	Cloudy	.810	76.4	74.6	70.8	N.	Cloudy	87.6	78.9	70.2	105.6	0.12	0.14	..	
.783	83.4	83.5	75.2	S. W.	Cumulo-strati	.836	76.5	75.2	70.6	N. W.	Cloudy	84.7	77.2	69.6	103.2	0.05	0.05	..	
.805	82.9	80.2	72.8	S.	Cloudy	.803	77.0	76.2	70.7	S.	Ditto	86.2	77.4	69.1	101.0	0.71	0.74	..	
.809	82.8	83.0	72.6	N. W.	Cirro-strati	.826	81.0	79.4	72.4	S. W.	Cirro-strati	83.4	74.3	65.1	99.4	0.05	0.06	..	
.814	82.0	81.6	71.6	S. W.	Cirro-strati	.809	79.0	78.3	73.0	S.	Cloudy	83.6	76.2	68.7	98.0	..	..	..	
.781	85.5	85.4	75.6	SS. W.	Cloudy	.818	81.2	79.0	72.7	S.	Raining	86.5	77.2	67.8	104.6	0.05	0.05	..	
.771	83.0	80.6	72.4	S.	Cirro-strati	.855	73.0	71.0	69.4	S.	Ditto	86.5	78.1	69.7	102.4	0.46	0.50	..	
.758	83.4	83.9	73.6	N. W.	Cloudy	.748	81.3	80.2	74.0	S. E.	Cirro-cumuli	84.0	76.1	68.2	101.0	1.25	1.25	..	
.681	77.2	77.0	70.3	WSW	Ditto	.685	77.8	76.4	71.9	S.	Cloudy	80.0	73.6	67.2	94.0	0.43	0.47	..	
.599	78.0	77.4	66.4	N. W.	Ditto	.630	76.2	75.0	65.6	N. W.	Cumulo-strati	78.2	72.7	67.2	89.7	..	..	..	
.744	82.0	81.8	66.2	WSW	Clear	.747	79.8	78.0	69.0	S.	Clear	82.4	73.8	65.2	96.4	..	..	..	
.679	88.4	88.8	69.6	S. W.	Ditto	.685	84.0	81.8	71.0	S.	Ditto	89.0	78.2	67.4	104.0	..	..	..	
.628	91.2	90.6	77.8	S.	Ditto	.633	86.2	84.4	77.4	S.	Ditto	92.4	82.6	72.7	108.2	..	..	..	
.704	91.0	91.6	76.8	W.	Cloudy	.704	86.6	85.0	78.4	N. E.	Cloudy	91.8	84.2	76.0	111.6	..	..	..	
29.776	85.8	85.6	72.5	.....	.....	29.789	82.3	80.8	72.4	.....	.....	87.1	78.7	70.2	102.1	5.74	6.08	6.08	







# JOURNAL

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*A Twenty-first Memoir on the Law of Storms in the Indian and China Seas; being the Cyclone of H. M. S. Fox, in the Bay of Bengal, 30th April to 5th May 1851. By HENRY PIDDINGTON, President of Marine Courts.*

In the following Memoir, for the materials of which I am principally indebted to the zeal of Capt. Biden of Madras, the same arrangement as with preceding ones has been adopted; that is, the documents are first given, and then a Tabular abstract of them, which is followed by a detailed statement of the grounds on which the various positions of the centre are laid down on the Chart, and by such observations on the various phenomena of the Cyclone as may have seemed necessary to direct attention to them.

*Abridged extract from the Log of the Ship Diana, Capt. Fletcher, from Sydney, forwarded by Capt. C. Biden, Madras.*

*April 29th.*—Moderate breeze during the night from W. S. W. to S. W. At 8 A. M. severe squall with heavy rain. Noon strong breeze and cloudy. Latitude by D. R.  $1^{\circ} 41' S.$ ; Long. by D. R.  $86^{\circ} 17' E.$

*30th.*—Fresh breeze with hard squalls and heavy rain and lightning. During these twenty-four hours wind veering from S. W. to West. Latitude by Obs.  $00^{\circ} 06' N.$ ; Long. by Obs.  $86^{\circ} 00' E.$

*May 1st.*—Fresh breeze with hard squalls and heavy rain; in reefs, and made all preparations for heavy weather, obliged to haul the foresail up





while the squalls lasted. Latitude by D. R.  $1^{\circ} 56' N.$ ; Long. by D. R.  $86^{\circ} 20' E.$

*May 2nd.*—Throughout these twenty-four hours strong gale with terrific squalls, accompanied with a deluge of rain and vivid lightning. Found the ship had been set by the current to the Eastward twenty miles, although heading N. W. by N. to W. N. W. Wind W. by S. to S. W. Latitude by Obs.  $3^{\circ} 04' N.$ ; Long. by Obs.  $87^{\circ} 00' E.$  Fresh gale with hard squalls and heavy sea. Split main top-sail, handed fore-sail and fore top-sail.

*May 3rd.*—Hove ship to under close-reefed main top-sail. Noon more moderate, made sail again. Wind from W. S. W. to S. W. by S. Latitude by D. R.  $4^{\circ} 15' N.$ ; Long. by D. R.  $87^{\circ} 05' E.$  Commences with fresh breeze and cloudy. At 8 p. m. severe gale with heavy sea. Hove ship to again under close-reefed main top-sail.

*May 4th.*—At 2 a. m. more moderate, made sail again. Noon, blowing hard, handed main-sail. Wind W. S. W. to S. W. by S. Latitude by D. R.  $4^{\circ} 50' N.$ ; Long. by D. R.  $86^{\circ} 50' E.$  Strong gale throughout.

*May 5th.*—At 11 a. m. ship hove to sixteen hours during this day's log. Wind S. W. to S. S. W. Latitude by D. R.  $5^{\circ} 4' N.$ ; Long. by D. R.  $86^{\circ} 10' E.$  Commencing with squalls and wind more moderate. At 8 p. m. blowing hard with heavy squalls during the night.

*May 6th.*—Noon. Ditto W. wind S. S. W. to S. W. Latitude by Obs.  $5^{\circ} 23' N.$ ; Long. by Obs.  $85^{\circ} 44' E.$

*Extract from Log Barque Hannah, Capt. H. Smith, from Penang bound to Madras. Civil Time. Forwarded by Capt. C. Biden.*

*Tuesday, April 29th.*—Commences with gloomy and unsettled weather throughout the forenoon. P. M. calm with very unsettled and squally appearance round the compass and *heavy swell from the southward.* Midnight moderate breeze from the westward and clear. Lat. D. R.  $8^{\circ} N.$ ; Long.  $82^{\circ} 50'.$

*Wednesday, April 30th.*—Daylight fine with westerly wind, coast of Ceylon in sight, Friar's Hood bearing W. S. W. Noon calm, p. m. weather looking again very unsettled and squally. 2 p. m. wind round the compass with heavy rain. 5 p. m. strong breeze sprung up suddenly from the W. N. W. with very threatening appearance all round the compass, in first reef of top-sails, 6 p. m. tacked ship, wind westerly, midnight moderate breeze and clear. Lat.  $7^{\circ} 50'.$ ; Long.  $82^{\circ} 08'.$

*Thursday, May 1st.*—Daylight, light drizzling rain appearing from the N. N. W. wind variable and puffy; down main royal yard, in second reef of top-sails; towards noon heavy squalls from the westward and much rain



with heavy cross sea. P. M. tremendous squalls in quick succession from W. S. W. and S. Westward with every appearance at times of a gale of wind, at other times clearing as quickly. 3 P. M. battened down hatches fore and aft, got all prepared for bad weather. During this night strong squalls from the South-westward with heavy thunder and lightning and rain : *between the squalls quite calm, the ship often losing steerage way*—the sea awfully confused. Lat.  $8^{\circ} 40' N.$  ; Long.  $81^{\circ} 43' E.$

*Friday, May 2nd.*—Daylight steering to the N. N. Westward with strong gale and cross sea, ship knocking about awfully, sent down mizen topmast ; 8 A. M. wore ship finding the gale increase while the ship's head was to the Northward ; kept the wind free for about two hours, trying to push to the Southward ; but the cross sea increased so rapidly, threatening to sweep the decks every minute, were compelled to lay to under main topsail and canvas in the mizen rigging ; main topsail yard went near the slings ; noon gale increasing with tremendous squalls and rain ; P. M. saw a barque running to the Eastward under closed-reefed topsails and reefed foresails, wind Westerly, veering about two points each way, sea running very high and confused, ship labouring much, often dipping the lee quarter boat in the water. 10 P. M. during this night all hands including native passengers slept in the cabin. Lat. D. R.  $8^{\circ} 40' N.$  ; Long. D. R.  $82^{\circ} 10' E.$

*Saturday, May 3rd.*—Daylight clear, blowing a hard gale of wind from the Westward with awful sea ; noon moderating, made sail and wore ship to the N. Westward, weather moderate and clear ; towards midnight gale increasing ; in main topsail, courses and jib ; during this night blowing hard with heavy puffs, wind Westerly. Lat. D. R.  $8^{\circ} 53' N.$  ; Long.  $82^{\circ} 25' E.$

*Sunday, May 4th.*—Daylight fine, wind moderating, set courses and main topsail. Noon do. weather, wind S. W. by W. with heavy cross sea, weather continuing clear. Midnight gale increasing with tremendous puffs of wind ; in mainsail and jib. Lat. D. R.  $9^{\circ} 00' N.$  ; Long.  $83^{\circ} 00' E.$

*Monday, May 5th.*—Moderating, set mainsail and jib, all hands employed during the day repairing damages aloft, &c. Noon P. M. blowing hard with confused sea in mainsail and jib. Lat. D. R.  $9^{\circ} 40' N.$  ; Long.  $81^{\circ} 50' E.$

*Tuesday, May 6th.*—Daylight blowing hard, wind steady with very fine weather aloft. 8 A. M. moderating set mainsail and jib. 10 P. M. suddenly lost the strength of the wind, saw the land of Nagore, bearing West. Noon out all reefs. Lat. Obs.  $11^{\circ} 4'$  Long.  $80^{\circ} ; 10'.$



*Extract from the Log of H. M. S. Fox, Commodore Lambert; from Trincomalie bound to Madras. Civil Time. Log forwarded by Capt. C. Biden, M. A. Madras. A few additions from the newspaper abstract.*

*At Noon 1st May, 1851.*—H. M. S. *Fox* was by Acct. in Lat.  $8^{\circ} 57' N.$ ; Long.  $81^{\circ} 17'$  (Madras bearing N.  $13^{\circ} W.$  256 miles) standing to the N.  $\frac{1}{2} W.$  and N.  $\frac{1}{2} E.$  to midnight  $7\frac{1}{2}$  to  $2\frac{1}{2}$  knots. Wind variable from W. b. N. to W. N. W. force (6) to (9).<sup>\*</sup> Weather thick and squally with thunder, lightning and rain. Bar. *rising* from 29.67 at 3 p. m. to 29.74 at midnight; Ther.  $82^{\circ}$ . The direction in which the lightning was seen is not given.

*2nd May.*—A. m. wind variable from North to W. b. N. Force (5) to (9) at noon marked N. N. W. (9.) Ship standing to the N. East. Bar. 8 a. m. 29.67; at noon 29.60; Ther.  $82^{\circ}$ . Squally, thick rainy weather throughout. Noon, Lat. Acct.  $10^{\circ} 0' N.$ ; Long.  $81^{\circ} 38' E.$  p. m. gale increasing to a hurricane; force marked (10) and (11.) Wind N. N. W. to 8 p. m. when W. N. W. again; at midnight ship heading to the N. E. Bar. 5 p. m. 29.53; at 8, 29.50; midnight, 29.47; ship lurching heavily and lying to under a close-reefed main topsail.

*3rd May.*—A. m. wind N. N. W. very heavy squalls (9) to (11). Bar. 29.37; at 6 a. m. W. b. N. (8) to (10). Bar. fell to 29.30: Symp. 29.20; at 9 (10); and at 9h 45' (12) when the ship was obliged to bear up for the safety of her masts; running 12 knots under the remnants of her close-reefed main topsail having previously lost the jibboom while lying with the lee quarter deck guns at times in the water:† heavy and confused sea on. At 4 a. m. the Bar. is marked 29.33; and at noon 29.37; Ther.  $82^{\circ}$ . Heavy squalls sea rain and thick weather. Noon Lat.  $10^{\circ} 21' N.$ ; Long.  $82^{\circ} 40' E.$  Wind W. S. W. To midnight, ship scudding to the East and E. b. S 70.3 miles in the 12h. Wind W. N. W. W. S. W. and S. W. (9) to (11) throughout.‡ Bar. 29.40 at 4 p. m. and 29.50 at 10 p. m.

*4th May.*—A. m. wind S. S. W. (11). Ship standing at 7 a. m. to the E. b. S. and at 8 hauled to the N. West. Wind till noon S. S. W. (9) to (10). Squally but clearing at times, Bar. 29.57 to 29.70 at 10 a. m. Noon Lat. Acct.  $10^{\circ} 22' N.$ ; Long. by Chr.  $84^{\circ} 35'$ . P. m. wind South to S. b. W. (8) to (10). Ship standing to the Westward. Gale decreasing, cloudy and squally. Bar. 29.70 to 29.72 at midnight; Ther. not marked.

*5th May.*—A. m. wind South, to noon (7) to (9). Ship standing to the Westward, squally with cloudy and blue sky. Bar. 29.74 to 29.80 at

<sup>\*</sup> Admiral Beaufort's numbers.      † From a notice in the Nautical Magazine.

‡ So in MSS. Log; though this must be an error.



noon; Ther.  $84^{\circ}$ ; Noon Lat. Obs.  $10^{\circ} 25'$  North; Long. Chr.  $83^{\circ} 55'$  East. P. m. to Midnight, weather fair. Wind S. S. W. to South.

*Extract from the Log of Ship Mary Ann, Capt. Darby; from Swan River bound to Madras. Civil Time. Forwarded by Capt. Biden.*

*Wednesday, April 30th.*—Light winds and variable from S. W. to North with heavy rain during the night. Bar. 29.67; Aneroid 29.65. Very close and sultry. Ther.  $84$ ; Lat. Obs.  $9^{\circ} 48'$  N.; Lat. by double Alt.  $9^{\circ} 50'$  N.; Lat. by Obs.  $9^{\circ} 47'$  N.; Long. by Chr  $81^{\circ} 33' 48''$  E.

*Thursday, May 1st.*—First part light breeze from the North. Noon wind variable from the Westward and North with rain; double-reefed topsails at 4 p. m. During the night very dull and oppressive weather, a few stars appeared but unable to obtain sights. Lat. by Account  $10^{\circ} 31'$  N.; Long. by Account  $81^{\circ} 8'$  E.; Bar. 29.60; Aneroid 29.60; Ther. 81.

*Friday, May 2nd.*—Strong gale and very variable from N. N. E. to N. W. with heavy rain, never ceasing in the 24 hours; during the night much heavy thunder and lightning in the Northern quarter, close reefed topsails and furled all but main topsail: 8, hove too under close-reefed main topsail. 3 p. m. Barometer still falling to 29.40. Sent down royal yards and made the ship snug for the night. Noon, Lat. by Acct.  $10^{\circ} 38'$  N.; Long. by Acct.  $81^{\circ} 17'$  E.; Bar. 29.52; Aneroid 29.53; Ther. 82.

*Saturday, May 3rd.*—Blowing a severe gale with heavy rain and terrific squalls at daylight; at 4 a. m. Barometer 29.30. Ship lying to under close-reefed main topsail. Noon, Barometer 29.33; p. m. still blowing hard, with less rain toward evening. Midnight, Barometer 29.30. Wind from West to S. West.

*Sunday, May 4th.*—A. m. blowing still a gale, and sea much confused, lying to under main topsail. Noon a most fearful sea struck the ship, and filled the deck full of water. No sights. Lat. Acct.  $11^{\circ} 49'$  N.; Long. Acct.  $82^{\circ} 34'$  E.; Bar. 29.38; Aneroid 29.35; Ther. 82; p. m. blowing hard with high sea; at 8, more moderate. Wind at S. S. W. set close-reefed fore top-sail and reached her under the two top-sails. Midnight, Bar. 29.40 inclined to rise.

*Monday, May 5th.*—A. m. wind inclined to moderate, but heavy sea running; at daylight, Barometer 29.45. Noon more moderate, made sail. Lat. by Obs.  $10^{\circ} 11'$ ; Long. by Chr.  $82^{\circ} 20'$ ; Bar. 29.55; Aneroid 29.55; Ther. 84.





*Extract from the Log of the Schooner Joseph Manook from Swan River to Calcutta, by Capt. H. S. Dick. Civil Time.*

*Memorandum—I have compared this with the vessel's Log and made a few additions. H. P.*

We had heavy N. W. squalls from  $1^{\circ} 30'$  to  $6^{\circ}$  N. Being then sheltered by Ceylon the wind became light and variable. I wished to call in at Madras, so kept as much to the Westward as possible, and in Lat.  $10^{\circ} 30'$  N. and Long.  $81^{\circ} 8'$  E. on the—

*1st May*—The Barometer began to fall from 29.82 to 29.72; Ther.  $82^{\circ}$  with heavy dark appearance and much rain: at 5 p. m. Civil Time, tacked to the S. W. wind W. N. W. and the Bar. had risen to 29.78. Midnight very heavy N. W. squalls and much lightning to the Eastward. Bar. 29.78: close-reefed and sent top gallant yards upon deck.

*May 2nd.*—Wore to the N. West; wind West; Bar. 29.77; at 3 a. m. wind North, blowing hard with every appearance of a gale, though the Bar. high, being 29.78; at daylight weather the same, Bar. 29.78: at 8 a. m. down main topmast and in flying jibboom, Bar. 29.74; 11 a. m. blowing hard from N. N. W. and a high sea: in topsail. Noon Lat. by account  $10^{\circ} 40'$  N.; Long.  $81^{\circ} 3'$  E.; Bar. 29.72; blowing very hard, and a high sea running; at 2 p. m. Bar. 29.64 wind N. W. by W. blowing half a gale, hove the vessel to under storm sail, with her head to the North Eastward, the sea running very high with rain. Midnight ditto weather Bar. 29.56.

*May 3rd.*—1 a. m. blowing hard with rain; wind N. W.; Bar. 29.48; at 8 a. m. but little wind, vessel would not steer, but a heavy confused sea; at 7.30, a heavy gust from N. W.; Bar. 29.46; at 8 a. m. hard gale from W. N. W. and a tremendous heavy confused sea; Bar. 29.45; at 9 a. m. blowing with most violent gusts from West, shipped several heavy seas over the poop, unshipped the binnacle. The third sea washed the man from the helm nearly overboard; I ordered the helm to be lashed a lee as it was not safe for a man to remain there, had my tell tale compass screwed up under the top gallant forecastle; wind West by N.; Bar. 29.44; after 9 a. m. all hatches battened down, could not note the Bar., but the wind West, blowing in most furious gusts; at 4 p. m. opened one board of the hatch for some biscuits and to note the Bar. which was then 29.44; closed up the hatches for the night, so could not note the Bar.; wind during the night from W. to W. by S. blowing in most fearful gusts.

*May 4th.*—Daylight more moderate; wind W. by S. opened companion hatch and found the Bar. risen to 29.59; at 10, wind S. W. set reefed trysail and storm staysail; Bar. 29.62. Noon fresh gales with a tremend-





ous sea; Bar. 29.64; at 4 p. m. fine appearance but the Bar. had fallen to 29.59. I supposed by setting the trysail and staysail, we had made head way to the N. W. into bad weather again, wind S. S. W. wore ship to the S. E.; at 8 p. m. decreasing gales and fine appearance, sea still very high: Bar. 29.73. Midnight strong gales from South, Bar. 29.75.

*May 5th.*—At 4 a. m. fresh gales and the sea very high, Bar. 29.76. Daylight fine. Blowing hard from the Southward and the sea running very high. I gave up all thoughts of going to Madras, as it was not prudent to stand to the N. W.; at 8 a. m. Bar 29.78; made sail and stood to the N. E. for Calcutta. Noon a very high sea; wind South; Bar. 29.86 and fine weather; Lat.  $10^{\circ} 49'$ ; Long.  $83^{\circ} 35'$  having been set to the S. S. E. 160 miles during  $3\frac{1}{2}$  days' gale. Midnight cloudy with rain; Bar. 29.90; sea still very high.

*May 6th.*—Fine clear weather; wind S. S. W.; Lat.  $13^{\circ} 26'$ ; Long.  $84^{\circ} 21'$ ; Bar. 29.96.

My little vessel rode most gallantly over the seas, with only a very small storm mainsail set, coming up and falling off only one point each way; I was never in so heavy a breeze before, it seemed almost impossible the little vessel could live in such a cross confused sea. By your book I fancy I was upon the right tack though perhaps you will censure me for not running to the S. E. but I thought it would only be a common monsoon gale which we expect in these months or I should have done so; and coming from the Southward we have had our Bar. ranging high, I thought nothing of the fall till it was below 29.67; as I have often had it as low as that in the bay during the S. W. monsoon for 6 and 7 days together.

*Extract from the Log of the H. C. Steamer Hugh Lindsay from Paumbum and Cuddalore to Madras. Civil Time. Forwarded by Capt. Biden.*

*On the 2nd May, 1851.*—The *Hugh Lindsay* at Noon had Porto Novo Chimney bearing S. W. Moderate breezes S. W. b. W. and heavy rain; Bar. 29.77. At 5, anchored at Tranquebar. At Midnight heavy squalls of wind and rain with lightning and thunder, and threatening appearances from the N. West with a heavy swell on. Wind W. N. W.; Bar. at 4 p. m. 29.69.

*May 3rd.*—A. m. the same; and a thick gloomy appearance all round; weighed at 3.30 a. m. At 7.30 a. m. wind W. N. W. Nagore Pagoda N. W. finding the wind and sea fast increasing, and every appearance of a heavy gale stood out to sea instead of anchoring at Negapatam. Bar. 29.40;\*

\* So in MSS. but apparently an error; 29.70 was probably meant?



at 2 A. M. : 29.62 at 8 A. M. : 29.60 at Noon, when eased the engines and hove to. P. M. N. W. to W. N. W. fresh gale and incessant rain. 9 P. M. Westerly. Sunset to Midnight, heavy squalls of wind and rain with a heavy sea. Bar. 29.55 at 2 P. M., to 29.58 at Midnight.

*May 4th.*—A. M. fresh gales, heavy sea and constant rain increasing at daylight to heavy gusts and a heavy sea running, all around thick and misty of a dull red colour. At noon the same. No observations. Bar. 29.50 at 2 A. M. ;\* at 4, 29.50 ; at 6, 29.52 ; at 8, 29.54 ; at 10, 29.58 ; and at Noon 29.57. Wind marked for the twelve hours Westerly to S. W. P. M. wind S. W. very heavy squalls and sea running very high. 4 P. M. moderating to Midnight. Bar. 29.52 at 2 P. M., to 29.70 at Midnight.

*May 5th.*—Weather becoming fine. Lat. Obs.  $9^{\circ} 59' N.$  ; Long. Chr.  $81^{\circ} 49' East$ .

*Register of Winds kept on board the dredging vessel at the Paumbum Channel, by Mr. Colin Gib, Superintendant, and forwarded by Capt. Biden.*

*May 1st.*—Wind S. W. Blowing fresh all day with heavy rain, thunder and lightning.

*May 2nd.*—Wind N. N. W. Fresh breeze during the 1st part of the day accompanied with rain ; at about 5 P. M. breeze freshened considerably with heavy rain ; and at about 9 o'clock it had increased to a hard gale, with tremendous gusts at short intervals ; in one of which the Port chain cable of the steam dredge snapped ; held on, however, with the remaining four ; wind veering frequently from S. W. to N. N. W.

*May 3rd.*—Wind S. W. Blowing a hard gale with violent squalls at times.

*May 4th.*—Wind S. W. Blowing a gale of wind ; and although sheltered by the Islands and reef there was a heavy sea running at the Buoy. Dredge riding uneasily.

*May 5th.*—Wind S. S. W. Gale still continues, but the squalls neither so frequent nor so violent.

*May 6th.*—Wind S. S. W. Blowing fresh ; weather more settled, gale evidently broken.

*Abridged Extract from the Log of the Barque Sarah from the Nicobars to Madras, forwarded by Capt. Biden. Civil Time.*

The *Sarah* was from the 28th to the 30th April with squalls from the S. W. and calms near the Nicobar Islands.

\* So in MSS. though 29.58 is marked at Midnight.



*April 30th, 1851.*—At Noon, the *Sarah* was in Lat. by Obs.  $6^{\circ} 36' N.$ ; Long.  $93^{\circ} 12' East$ . P. m. fresh S. S. W. winds and fine, increasing to Midnight, when cloudy with heavy squalls of wind and rain.

*May 1st.*—A. m. increasing from S. S. W. with heavy squalls and a high sea running, to daylight, when hard gales and heavy gusts “*veering from South to S. W.*” Hove to at 8, under bare poles. Noon, successive heavy gusts with a continuation of hard rain and heavy seas, with thick weather from the S. W. P. m. lying to under bare poles “*with continued heavy gusts of wind from South to S. W.*” Midnight blowing a perfect hurricane.

*May 2nd.*—Begins with continued heavy gusts blowing, and rain making “a mere drift of wind South to S. W.” Noon, moderating a little. 2 P. m. increasing again; and at 7 P. m. hurricane with an awful heavy sea. Midnight more moderate, made some sail.

*May 3rd.*—Daylight, heavy gusts again, moderating at times, and P. m. successive heavy squalls from S. to S. W. are marked. At Midnight strong breezes and squalls.

*May 4th.*—Apparently the monsoon breeze, with squalls, and on—

*May 5th.*—The Lat. by Obs. is marked  $10^{\circ} 40' N.$ ; Long.  $86^{\circ} 10' East$ . The *Sarah* had no Barometer on board, and no positions by D. R. are given during the bad weather.

*Extract from the Log of the Barque Ostrich, Capt. Stephenson, from Madras bound to Moulmein. Civil Time. Log forwarded by Capt. Biden.*

The *Ostrich* sailed from Madras on the 28th April, and on—

*May 1st, 1851,* at Noon, was in Lat.  $14^{\circ} 19' N.$ ; Long.  $82^{\circ} 45' East$ ; with wind from the E. N. E. and squally weather at Midnight. Bar. at Noon is marked at 29.75; Symp. 29.84; Ther.  $84^{\circ}$ .

*May 2nd.*—A. m. wind E. N. E; at 8, East; and at Noon E. N. E. again; heavy squalls with rain. Lat.  $13^{\circ} 10' North$ ; Long.  $83^{\circ} 10' E.$ ; Bar. marked for Noon at 29.60; Symp. 29.75; Ther.  $83^{\circ}$ . Midnight increasing gale and heavy squalls.

*May 3rd.*—Making all snug for bad weather. Violent squalls. A. m. wind E. b. N.; at 8, East; Noon to Midnight continued and increasing squalls, rain, and sea. Noon Lat.  $12^{\circ} 46' N.$ ; Long.  $83^{\circ} 00'$ ; Bar. 29.40; Symp. 29.60; Ther.  $82^{\circ}$ .

*May 4th.*—A. m. wind S. East. Strong gale and heavy squalls. Noon more moderate Lat.  $13^{\circ} 4' North$ ; Long.  $82^{\circ} 21' East$ ; Bar. 29.33; Symp.



29.39; Ther. 84°. At 2, p. m. wind E. S. E.; at 8, increasing again to Midnight, when wind is marked S. E.

*May 5th.*—A. m. wind S. S. E. Strong gales; 6 more moderate; under some sail, Bar. being at 2 A. M. at 29.26; Symp. 29.31, after which they began to rise. Noon Lat. 14° 54' North; Long. 82° 37' East; Bar. 29.60; Symp. 29.80; Ther. 83°. Midnight, out reefs.

*Abstract from the Log of the P. and O. Company's Steamer, Precursor, from Point de Galle towards Aden. Civil Time. Forwarded by Mr. Parfitt, Chief Officer.*

The *Precursor* left Point de Galle at 6.20 p. m. on the 30th April. Wind and sea increasing from W. b. S. Bar. 29.77 to 29.76 at Midnight, Sympiesometer not in good order: Ther. 81°.

*May 1st, 1851.*—A. m. strong winds W. b. S. and cloudy; heavy head sea and frequent squalls. 4 A. M. Bar. 29.74; Ther. 83°; at 8 A. M. Bar. 29.79. Noon more moderate, but very heavy sea, Lat. by Obs. 5° 5' N.; Long. 77° 3' East; Bar. 29.80; Ther. 85°. p. m. wind W. b. N. 4 p. m. Bar. 29.72; at 8, 29.82; Midnight 29.82. Wind and weather the same.

*May 2nd.*—Moderating to Noon when Lat. 3° 21' North; Long. 78° 18' East; Bar. 29.88; Current S. 55° E. 41 miles.

*Abridged Log of the Ship Hyderabad, Capt. Castles; from Calcutta to the Mauritius, reduced to Civil Time. Forwarded by Capt. C. Biden.*

*May 3rd.*—p. m. Lat. by Aect. (worked back from Noon of the 4th) 14° 05' N.; Long. 83° 47' East; 1 p. m. Bar. 28.90. Strong breezes from the East. Ship standing S. S. W. 6 p. m. wind E. S. E.; increasing, with a confused sea to Midnight. Bar. 28.80 at 8 p. m. and Midnight.

*May 4th.*—Increasing gales with a very heavy head sea; made all snug. Wind S. E. b. E. from 6 A. M. Noon blowing "a drift of wind." Lat. 12° 30' N.; Long. 82° 20' East; Bar. 28.74. Sea running very high. Ship running 4 knots per hour to the W. S. W.; p. m. the same; at 4, complete hurricane; ship on her beam ends for upwards of two hours; decks swept continually of every thing. Bar. from 28.74; at 1 p. m. to 28.70 at Midnight. Drift about  $\frac{1}{2}$  mile per hour. Wind for the p. m. and A. M. of the 5th is said to have been "mostly from S. E. b. E. to East; gradually veering to the Southward throughout the latter part."

*May 5th.*—At 4 A. M. Bar. 28.71; at 8, 28.72. Noon hard gale with a heavy sea. Wind about S. E. b. S. Noon Lat. by Aect. 12° 50' N.; Long.





81° 40' East; Bar. not marked; p. m. Bar. 28.74; more moderate, but a tremendous head sea. Wind E. b. S. at 8 p. m.; Bar. 28.80 at Midnight, and weather more settled.

*May 6th.*—At 4 a. m. Bar. 28.84. 5, wind E. S. E. Noon moderate Lat. 13° 57' N.; Long. 82° 37' East. Wind S. S. W.

*Abridged Extract from the Log of the Ship Mary Harrison; from Sonapore to Madras; by Mr. J. Sutherland, Chief Officer; forwarded by Capt. Biden. Civil Time.*

*May 2nd.*—Wind N. E. to N. N. E. at Noon, and then N. b. W. to N. E. again. Bar. falling from 29.60 a. m. to 29.50 at Noon; and 29.40 at Midnight; Ther. from 85½ to 83½. Squally and cloudy making preparations for bad weather. Heavy swell from S. E. and threatening appearance. Position at Noon Lat. 13° 41' N.; Long. 82° 15' East.

*May 3rd.*—Wind marked North to N. N. W. 4 a. m. Bar. 29.38; Noon 29.36; Midnight 29.30; Ther. 83½. Position at Noon Lat. 13° 12' North; Long. 81° 28' East. A. m. very squally; made all snug and hove to at 8 p. m. under close-reefed main topsail.

*May 4th.*—A. m. wind North. 8 a. m. N. N. W.; 8 p. m. N. W.; 10 p. m. shift to S. W. Bar. a. m. 29.30; Noon 29.05; 8 p. m. 28.91; 10 p. m. 28.80; Midnight 28.80. Position at Noon; Lat. by Acct. 12° 41' N.; Long. 81° 38' East. A. m. strong gale, and heavy sea getting up; "at 8 p. m. cleared up and wind moderated a little; at 10 p. m. sudden shift to S. W. throwing the ship almost on her beam ends;" lost main topsail, jibboom, &c.

*May 5th.*—A. m. "storm raging with unabated fury;" 4 a. m. heaviest; 4.30 a. m. abated to a strong gale; 5 a. m. Bar. started almost instantly from 28.80 to 29.03." Very confused sea, but ship behaving very well, wind throughout, S. S. W. to South. Noon, Lat. Acct. 13° 11' N.; Long. 81° 50' East; Bar. a. m. 28.84; at 5 a. m. 22.03; Midnight 29.58; Ther. 82° to 83½.

*May 6th.*—Confused irregular sea, but weather gradually becoming fine. Bar. 29.60 to 29.72; at Midnight Ther. 84°. Noon Lat. 13° 23' North; Long. 81° 52' East.



## Register of Day Observations taken by Capt. W. Farley, Actg. Master Attendant at Cocanada.

Date.	Sunrise.				At 10 a. m.				At 2 p. m.				Sunset.				Remarks.
	Bar.	Ther.	Winds.	Aspect.	Bar.	Ther.	Winds.	Aspect.	Bar.	Ther.	Winds.	Aspect.	Bar.	Ther.	Winds.	Aspect.	
May 1	29.84	85°	East.	Hazy.	29.81	88°	East.	Clear.	29.78	94°	S. S. E.	Clear.	29.76	87°	S. E.	Hazy.	1st.—Faint air and calms with sultry weather in the evening pleasant Easterly winds.
" 2	29.83	85	E. N. E.	Cloudy.	29.83	93	N. E.	Cloudy.	29.83	93	N. E.	Cloudy.	29.72	87	N. E.	Gloomy.	2nd.—Threatening appearances of heavy weather in the Bay; scud passing to the Southward prodigious-ly.
" 3	29.83	93	N. E.	Dark.	29.75	83	N. E.	Ditto.	29.75	83	N. E.	Ditto.	29.70	85	N. E.	Cloudy.	3rd.—Strong gales throughout and cloudy, attended with violent squalls and heavy rains and threatening weather to S. Eastward.
" 4	29.73	82	N. E.	Cloudy.	29.73	83	N. E.	Ditto.	29.70	82	N. E.	Ditto.	29.70	82	N. E.	Ditto.	4th.—Continuation of the weather of the preceding day; heavy rains during the night.
" 5	29.70	82	E. N. E.	Ditto.	29.77	84	East.	Ditto.	29.72	83	East.	Ditto.	29.70	82	S. E.	Ditto.	5th.—Commences with more moderate wind but a continuation of the weather. Noon fine.
" 6	29.88	83	S. E.	Ditto.	29.75	83	South.	Ditto.	29.73	83	S. S. W.	Ditto.	29.70	82	S. S. W.	Ditto.	6th.—Moderate and fine.

Observe.—The Barometers among the shipping ranged between 29.25 to 29.39. The same at Talarow in the residence of a Mr. Eaton, some 12 miles hence during the blow on the 3rd May. The winds were steady at N. E. for three days and gradually moderating; in the meantime veering to the Eastward by S. and S. E.



*Extract from the Log of the Ship Catherine Apcar, Capt. Fowler ;  
from Mauritius to Calcutta. Reduced to Civil Time.*

*May 2nd, 1851.*—Midnight, dark cloudy, unsettled weather with variable winds ; 4 to 8 A. M. calms ; 8 to 12, wind West to S. W., 5 knot breeze. Noon, Bar. 29.49 ; Symp. 29.20 ; Lat. Acct.  $10^{\circ} 44'$  North ; Long.  $84^{\circ} 14'$  East. P. M. light winds and calms, gloomy threatening appearance ; 4, freshening from Eastward ; at 8, strong gusts making preparations for bad weather. Bar. 29.43 ; Symp. 29.18. Midnight, hard squalls and rain. Wind Easterly.

*May 3rd.*—Dark cloudy and blowing very heavy at times. 2 A. M. wind E. S. E. ; 3, Bar. 29.33 ; Symp. 29.12 ; 5, wind still E. S. E. Bore up North. Bar. 29.29 ; Symp. 29.12 ; Noon strong breezes E. S. E. ; Bar. 29.40 ; Lat. Obs.  $12^{\circ} 40'$  ; Long. Chr.  $83^{\circ} 32'$ . Throughout the preceding 24 hours very heavy clouds hanging about the horizon, hot sultry weather and gloomy appearance, squalls heavy at times with heavy rain, but little or no sea on. P. M. fresh gale Easterly. Ship standing North ; 8, Bar. 29.50. Midnight, dense masses of clouds and hard squalls.

*May 4th.*—Hard squalls ; 8 A. M. fresh gales E. b. S. ; at 11, a terrific squall ; Noon, strong gales and heavy sea ; Lat.  $15^{\circ} 13'$  N. ; Long.  $82^{\circ} 66'$  E. Current N. 51 W. 33 miles. During the last 24 hours steady gales East and E. S. E. with hard squalls and much rain. P. M. the same decreasing at sunset ; 9 P. M. wind S. East.

*May 5th.*—Wind hauling to S. S. E. ; Daylight moderate ; Noon fresh breeze and squally. Lat.  $16^{\circ} 42'$  N. ; Long.  $84^{\circ} 25'$  East ; Bar. 29.67 ; Simp. 29.46 ; Current, N. 78 East 39 miles.

*Extract from the Log of the Ship "Atalanta," Capt. R. F. D. Towle ;  
from Coringa bound to Pondicherry, forwarded by Capt. Biden.*

*April 30th, 1851.*—Light winds throughout from S. S. E. : S. E. and E. S. E. with occasional calms and slight showers, Lat.  $12^{\circ} 45'$  N. ; Long. Chr.  $83^{\circ} 58'$  E. ; Bar. Noon 29.80.

*May 1st.*—Variable winds with fluctuating Bar. Smart squalls from East, veering to N. E. and N. N. W. Steered S. b. W. : S. S. W. and S. W. At Noon gloomy all round with drizzling rain, wind light at N. E. Lat. Acct.  $11^{\circ} 34'$  N. ; Long. Acct.  $83^{\circ} 40'$  E. ; Bar. Midnight 29.76 ; 4 A. M. 29.66 ; 8 A. M. 29.72 ; Noon 29.75 ; Bar. 3 P. M. 29.61 ; 5, 29.63 ; 6, 29.66 ; 8, 29.68 ; 9, 29.70 ; 11, 29.70. Light winds and cloudy. At 11 P. M. dark gloomy weather with drizzling rain, winds flying about from S. E. to



E. S. E. East, N. E. and N. N. W. At Midnight, winds light and variable from N. N. W., N. E. and E. S. E. with vivid lightning, showing a heavy black bank to the Southward.

*May 2nd.*—In all sail. At 0.30 a hard squall from E. S. E. with heavy rain, thunder and lightning, kept away West under topmast staysail. At 2 A. M. light winds from N. N. W. round to East, and back again. At 5 A. M. wind apparently steady at North; set double-reefed topsails, foresail, and bent and set a new fore topmast staysail (the other having split) steered South and S. S. W. At 10 A. M. a threatening appearance all round, wind veering in heavy gusts from North to N. W. in all sail and scudded South under fore topmast staysail. Supposing from appearances this to be the commencement of a hurricane or heavy gale, the centre of which would now be about E. N. E. of us, the wind being N. N. W. kept South to run out of it, according to the theory of storms and made all snug. Noon dark gloomy weather Bar. fast falling, sea getting up and wind agitated with every indication of a gale, wind *flying about from North to N. W. and vice versa* with heavy puffs and rain. Got stay tackles on foremast to cat-heads. Ship scudding as before South and S. S. W. under fore topmast staysail. 2 A. M. Bar. 29.64; 4, 29.64; 5, 29.66; 8, 29.64; 9, 29.63; Noon 29.61; Lat. Acct. 10° 46' N.; Long. Acct. 81° 41' E. P. M. strong gales, from N. N. W. dark gloomy weather and heavy rain. Ship scudding South, under fore-topmast staysail. At 3 P. M. constant heavy squalls, rain and a high sea. Lashed the courses and fore topsail to the yards with studding sail gear, and jib to the boom. At 5 P. M. Barometer still falling, squalls more frequent and very heavy, accompanied with a torrent of rain. Close reefed and set main topsail, and hove ship to on port tack. Wind then at N. N. W. Head up to N. E. off to East. At 6 P. M. the wind shifted in a furious squall to W. N. W. then to West. We on the right tack to meet it. Ship's head up North, off N. E. with the sea. Midnight blowing a heavy gale, squalls harder and more frequent with a deluge of rain and scud, a tremendous sea running and ship lurching heavily, as well as shipping a great quantity of water over all every time she lunched to leeward. Bar. 3 P. M. 29.55; 5, 29.53; 7, 29.51; 8, 29.58; 10, 29.56; Midnight 29.56.

*May 3rd.*—A. M. gale blowing with unabated fury, violent squalls and rain as before. Sea running in Pyramids. At 4 A. M. *frequent lulls of two to five minutes duration followed by furious gusts*, in one of which the main topsail blew away, as also the lee side of mainsail. Ship lurching heavily and shipping much water over all. Noon, blowing a hurricane at W. S. W. Ship's head up N. N. W., off to North. 2 A. M. Bar. 29.52;



4, 29.54; 6, 29.55; 9, 29.60; 11, 29.54; Noon 29.54; Ther. 79°. \* P. M. furious squalls from W. S. W. heavy rain and high sea. Ship lurching violently at times and shipping much water. Hove to under bare poles. Head up N. N. W. off N. N. E.

*May 4th.*—Midnight, the wind shifted to the S. W. blowing with the same fury. *Lulls between the gusts as yesterday.* A constant wash of water across the deck, vessel making no water to speak of. Noon, squalls less frequent and violent. Still blowing hard with heavy confused sea. 2 P. M. Bar. 29.54; 4, 29.49; 8, 29.50; Midnight 29.56. P. M. strong gales from S. W. with heavy confused sea; got a new fore royal in the mizen rigging to keep the ship to the wind. Head up W. N. W. off N. W. b. N. At 6, the mizen stay carried away close to the main mast, got a tackle on it and set it taut. At 9 P. M. gale fast abating and sea going down. 10, Lat. per Mer. Alt. 41° 46' N.; 10.30 P. M. Lat. per Mer. Alt. Spica 10° 47' N. Wind at South. 2 A. M. Bar. 29.54; 4, 29.52; 8, 29.58; 10, 29.66; Noon 64; Ther. 82°. Bar. 2 P. M. 29.64; 8, 29.68; Midnight 70.

*May 5th.*—Midnight, moderate and fine with confused sea, and lighting to the N. W. Daylight ditto weather with high sea. Noon, fresh steady breezes with fine clear weather. A confused sea still running. Lat. Obs. 10° 53' N.; Long. Chr. 83° 34' E.; Bar. 29.80; Ther. 85°. Set the jib. 8 A. M. Bar. 29.75; Noon 80.

*Notes of the Weather experienced at Vizagapatam between the 30th April and 6th May, 1851, by G. Hudson, Esq. Master Attendant.*

*Wednesday, April 30th.*—Variable light airs and sultry weather throughout. *An unusually clear atmosphere* without a cloud in the sky. The sea very smooth and of a dark blue color. *The distant hills around (at other times obscured by haze) presented a bright and clear appearance,* and the verdure on them was perceptible to the naked eye. Bar. 29.80. †

*Thursday, May 1st.*—The first part of this day light airs from the N. W. inclining to a calm. Sun bright and powerful. Bar. 29.80. *Emily* 29° 85'.

Noon, light Northerly airs veering to N. E. and continued in that quarter to the evening. A smooth sea and a long swell setting in from the Eastward.

\* No position given.

† This range of Barometer is from the Log of the Bark "*Emily*" wrecked at Bimlipatam 20 miles North of this place; at 4 P. M. on Monday, May 5th, 1851, by the heavy sea and Easterly squalls driving her from her anchors.





Sunset, wind veering gradually to the Northward and cloudy in that quarter.

*Friday, May 2nd.*—Commences with moderate N. W. winds, and increasing swell from the Eastward. Sky overcast. Bar. 29.80; *Emily*. 29.78.

Midday, a dense horizon and cloudy.

Sunset, similar weather. Barometer indicating a slight change. Bar. 29.73.

*Saturday, May 3rd.*—Fresh N. W. winds with thick hazy weather.

Noon, wind veering to N. and N. E. and threatening appearances in that quarter with drizzling rain. A high sea tumbling in from Eastward. Bar. A. M. 29.72; Noon 29.69.

Sunset, sharp squalls and heavy rain from N. E. Sea increasing.

*Sunday, May 4th.*—Baffling winds from N. E. to East without any increase. Weather assuming thick and gloomy appearances. Bar. 29.78; Sunset 29.75 and 29.64.

Sunset, ditto weather. Wind drawing round to the E. S. E. in heavy squalls and much rain, with intermittent lulls.

*Monday, May 5th.*—Winds from S. E. in hard squalls with heavy rain and thick, dark weather. The sea all this day running fearfully high, and surf breaking as far as the eye could see. Bar. 29.75 and 29.68.

Sunset, wind Southerly with dense black clouds overhead, and heavy rain throughout the night.

*Tuesday, May 6th.*—Winds S. and S. W. Weather clearing up and a moderating confused sea. Bar. 29.80.

We have not had our usual strong S. S. W. winds, or as termed *along shore* Winds, in the month of April. The two days before the gale, I, as well as others, observed that the atmosphere was unusually clear; not a cloud was seen in the heavens. Stars at night very bright, beautifully clear horizon, a dark blue smooth sea, and the distant hills around appeared clear and brighter than usual to the eye. This strange and sudden change of fine weather for this season, from my long experience on this coast, I have invariably found the forerunner of a storm.

*Abstract of the Log of the Barque Paragon, Capt. ———; from Masulipatam to Vizagapatam. Civil Time.*

*May 3rd, 1851.*—A. M. squally from N. E. b. E. Ship working to the N. East. Noon strong gales with thick cloudy weather. Lat. 17° 00' North; Long. by Acct. 83° 15' East; 3 P. M. Bar 29.67; Symp. 29.66; making all snug, gale increasing to Midnight, when Bar. 29.66.



## AT MADRAS.

The following are the various documents forwarded to me by Capt. Biden or published by him in the newspapers and abridged to suit our purpose where necessary. The Cyclone was felt only as a severe Northerly, N. Westerly, Westerly and South Westerly gale at Madras, but of sufficient severity and menacing appearance to order all the ships to sea from the roads.

" Sunday afternoon, the 4th May, became more squally than we have already described this morning, and the glass showed a downward tendency throughout; although, with us at any rate, it did not fall rapidly till after one A. M. on Monday the 5th, between which and 4 o'clock it reached its lowest depression, 29.110. Soon after 3, the wind began to blow in violent gusts, increasing to a gale as day drew on. At the Observatory, its greatest force was between 8 and 9 o'clock A. M., but it appeared most violent with us, and certainly did all the mischief done, some time before that. This, however, was at a distance of five miles from the Observatory, and judging from the much greater damage sustained in our neighbourhood, as regards the levelling and rending of trees, the stripping of hedges, the mutilating and killing of birds, &c., we should infer that the wind was stronger, as well as earlier in its visit to us, than at the spot of official observation. This remark applies indeed to the Presidency generally, where only the gardens seem to have suffered.

" The amount of rain that fell during Sunday night and Monday morning, was very great for the time of year. Below we give the Observatory record, but whether it indicates as much as fell in parts to the North West of Madras, since the country was far more flooded than we have before seen it after a similar amount of fall.

		RAIN,		WIND.		
		Inches.	Direction and Force.			
May 2nd—	0.298	N. N. E.	Gentle breeze.			
„ 3rd—	3.822	N. by E.	Fresh breeze.			
„ 4th—	2.890	N. N. W.	Strong breeze.			
„ 5th—	11.445	S. by W.	Squall and gale.			
Total—		18.455				

" At 6 P. M. on the 4th there was a heavy sea on, the rollers breaking amongst the Dhonies and beyond 5 fathoms, and the surf had much increased—whilst a rapid scud and other threatening indications seemed to be the precursor of a severe gale. The Barometer was then at 29.464 and the wind North."





" *May 4th.*—Brisk gale N. E. b. E with lightning in the S. E. At 2. 30, Bar. 29.60; 6 A. M. Wind E. b. N. Noon *more moderate*, with a heavy rolling sea. Lat.  $16^{\circ} 24'$  North; Long.  $83^{\circ} 26'$  E.: Bar. 29.68. P. M. wind E. b. N. gale increasing and a high sea running in all directions. At 10h. 30' P. M. wind chopped to S. East. Midnight moderating.

" *May 5th.*—A. M. strong breezes S. E. with a heavy sea from South; 2 P. M. Bar. 29.70. Noon moderating Lat.  $16^{\circ} 41'$  North; Long.  $84^{\circ} 18'$  East.

"Twelve native vessels (Brigs and Dhonies) were said to be missing, and the Barometer on this day, 5th May at 5 P. M. is stated to have been at 29.53, the wind South and the sea much fallen."

*"Extraordinary Observations of the Standard Barometer at Madras,  
2nd and 4th May, 1851.*

Date.	Time.	Bar, uncorrected.	Ther.	Wind.	Date.	Time.	Bar, uncorrected.	Ther.	Wind.
Friday, May 2nd, 1851.	A. M. h. m.				May 2nd.	P. M. h. m.			
	8 41	29.808	85.0	N. E.		41	29.723		N. b. E.
	9 41	790	85.0	North.		51	723		
	51	788	85.0			3 1	714		
	10 1	792	85.0			11	712		
	11	794				21	712		
	21	796				31	706		
	31	790				41	702		N. N. W.
	41	794	85.5	N. N. E.		51	700		
	51	790				4 1	700		
	11 1	786				11	700		
	11	790				21	704		
	21	796				31	710		
	31	800	85.0	East.		41	716		N. b. E.
	41	788				51	704		
	51	784				5 1	710		
	0 1	777				11	700		
	11	770				21	696		
	21	774				31	690		
	31	776				41	686		N. b. W.
	41	792	83.0	North.		51	684		
	51	796				6 1	688		
	55	803				11	694		
	1 1	782				21	694		
	5	761				31	696		
	11	758				41	698		N. b. W.
	21	746				51	702		
	31	734				7 1	704		
	41	730		N. b. E.		11	710		
	1 51	730				21	720		
	2 1	732				31	720		
	P. M. 2 11	728				41	722		N. b. W.
	21	723				51	724		
	31	720				8 1	725		
						11	725		





1852.]

*A Twenty-first Memoir on the Law of Storms.*

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Date.	Time.	Bar, uncorrected.	Ther.	Wind.	Date.	Time.	Bar, uncorrected.	Ther.	Wind.
Friday, May 2nd, 1851.	P. M.				May 3rd.	A. M.			
	7	21	29.722			5	51	29.620	
		31	718			6	1	628	
		41	724	North.			11	631	
		51	724				21	638	
	9	1	727				31	644	N. N. E.
		11	731				41	642	
		21	732				51	650	
		31	734	North.		7	1	654	
		41	736				11	662	
		51	733				21	667	
	10	1	736				31	664	North.
		11	738				41	670	
		21	740				51	672	
		31	740			8	1	672	
		41	737	N. E.			11	668	
		51	736				21	676	
	11	1	731				31	680	North.
		11	727				41	676	
		21	720				51	680	
Saturday, May 3rd, 1851.	A. M.					9	1	686	
	0	1	29.712	N. b. E.			11	686	
		11	708				21	686	
		21	704			10	1	700	
		31	705				11	702	
		41	703				21	697	
	1	11	683				31	678	N. N. E.
		21	680				41	680	
		31	675				51	678	
		41	670	N. b. E.		11	1	672	
		51	664				11	656	
	2	1	652				21	660	
		11	651				31	664	
		21	644				41	654	
		31	644				51	654	
		41	640	N. W.		P. M.	0	1	654
	3	1	630				11	652	
		11	627				21	640	
		21	618				31	641	
		31	620				41	632	
		41	624	N. W.			51	630	
		51	638			1	1	622	
	4	1	630				11	624	N. N. E.
		11	631				21	616	North.
		21	632				31	610	North.
		31	634				41	608	N. N. E.
		41	628	N. b. W.			51	600	North.
		51	630			2	1	597	
	5	1	630				11	591	
		11	626				21	587	North.
		21	638				31	583	North.
		31	634				41	586	North.
		41	630	N. b. E.			51	581	N. N. E.
						3	1	574	N. N. W.





Date.	Time.	Bar. uncorrected.	Ther.	Wind.	Date.	Time.	Bar. uncorrected.	Ther.	Wind.
May 3rd,	P. M. h. m.				May 4th,	A. M. h. m.			
	3 11	29 568		N. N. W.		0 41	29.594		N. b. E.
	21	580		N. N. E.		1 1	590		
	31	582		North.		11	584		
	41	578		North.		21	578		
	51	576				31	574		
	4 1	570				41	570		N. N. E.
	11	568				51	567		
	21	574				2 1	562		
	31	576				11	560		North.
	41	580		N. E. b. N.		21	555		
	51	580				31	550		
	5 1	580				41	548		North.
	11	584				51	544		
	21	586				3 1	540		North.
	31	590				11	536		
	41	598		North.		21	534		N. b. E.
	51	600				31	532		
	6 1	602				41	530		North.
	11	602				51	534		
	21	608				4 1	540		
	31	614				11	540		North.
	41	614		N. E. b. N.		21	542		
	51	616				31	542		N. b. W.
	7 1	614				41	544		
	11	614				51	544		North.
	21	610				5 1	546		
	31	615				11	548		
	41	622				21	545		
	51	630				31	544		North.
	8 1	628				41	540		
	11	628				51	538		
	21	630				6 1	542		
	31	632				11	548		North.
	41	640		N. b. E.		21	544		
	51	640				31	546		
	9 1	643				41	547		
	11	645				51	556		
	21	646				7 1	560		
	31	646				11			
	41	646		N. N. E.		21			
	51	647				31			
	10 1	647				41	556		N. N. E.
	11	648				51			
	21	645				8 1			
	31	640				11			
	41	637		N. N. E.		21			
	51	638				31			
	11 1	638				41	570		North.
	21	636				51			
	31	634				9 1			
	41	630		North.		11			
	51	620				21			
						41	572		North.
						51			
						10 41	557		N. N. E.
						11 41	549		North.
						P. M.			
						0 41	492		North.
						1 41	470		N. N. E.
Sunday, May 4th, 1851.	A. M. h. m.								
	0 1	616							
	11	612							
	21	608							
	31	602							





Date.	Time.	Bar, uncorrected.	Ther.	Wind.	Date.	Time.	Bar, uncorrected.	Ther.	Wind.
May 4th,	P. M. h. m.				May 5th,	A. M. h. m.			
	2 41	29.458		N. N. W.		9 21	482		South.
	3 41	448		North.		41	493		South.
	4 41	434		North.		10 21	502		
	5 41	464		North.		41	518		S. E.
	6 41	466		N. N. W.		11 21	542		
	7 41	476		N. N. W.		41	540		S. E.
	8 41	490		N. N. W.		P. M.			
	9 41	454		W. N. W.		0 21	556		
	10 41	464		N. N. W.		41	560		South.
	11 41	406		N. W.		1 21	555		
May 5th,	A. M.					41	556		South.
	0 41	400		N. W.		2 21	560		South.
	1 41	380		W. N. W.		41	560		South.
	2 41	362		W. N. W.		3 21	570		
	3 41	336		W. S. W.		41	570		S. b. W.
	4 41	347		S. W.		4 21	582		
	5 41	322		S. W.		41	596		S. b. E.
	6 41	362		S. W.		5 41	626		South.
	7 41	392		S. W.		6 41	662		S. b. E.
	8 41	432		S. W.		7 41	699		South.
						8 0	708		South.

Lowest at 5h. 36.—29.316.

10 A. M.	4 P. M.
Maximum.	Minimum.
Diff.	
2d —29.800 —	29.684 Diff.
3d — .702 .098	.568 116
4th— .593 .109	.432 136

N. B.—On the 2nd and 3rd instant the wind hauled round repeatedly to N. N. E. and from 10 P. M. to midnight, on the 2nd it was N. E.; at 11 A. M. on the 3rd the wind was N. N. E.

C. B.

*“Further particulars of the late Gale.” Extracts from the Log of the Barque Palm.*

Barque *Palm* slipped May 3d, 6h. 40m. A. M., steered E. S. E. until 2 P. M., going 5 knots. She hove to under close reefed main top sail and mizen stay sail, lying E. N. E. then N. E., North, and N. W.; at 2 P. M. May 5th, blowing very hard with heavy sea and rain, lost our stern boat and had main topsail blown away, noon on same day more moderate, 2 P. M. made sail. May 6th 9 A. M. set main sail, 10.30 made Sadras Hills, and 3.20 anchored in Madras Roads, passed several pieces of wood, apparently teak.





Monday, at 2 A. M., Barometer fell to 28.95, wind W. S. W. blowing a very hard gale, with a tremendous sea on, which broke in over the lee gangway. Captain Norie thinks he was 70 miles S. E. from Madras.

(Signed) J. NORIE,

*Master of the Barque Palm.*

*Extracts from the Log of the Barque James Hall.*

*Saturday, May 3rd, 1851.*—At 3.30 P. M., put to sea with the *Sophia* in company under reefed fore sail and main try sail. At 8 P. M. Madras light N. W. in 23 fms. At 10 P. M. light hardly discernible from the deck; N. W. b N. midnight frequent squalls with heavy rain, Barometer 29.61; split the fore top mast staysail.

*Sunday, May 4th.*—A. M. heavy squalls with a confused sea. Vessel pitching deep with incessant gusts of wind; in main trysail at daylight. At 8 A. M. the Barometer falling fast to 29.50 hauled up the foresail and stowed it, vessel taking heavy lee lurches. The lee quarter boat under water at times; hove the ship to under bare poles. Three sail in company under close reefed topsails. From 1 A. M. to 10 A. M. wind at North; Hd. from E. to E. S. E. Noon heavy gales with drizzling rain and a high sea on, vessel taking heavy lee lurches and the sea making a clean breach over all; Barometer 29.41. From 11 A. M. to 4 P. M. wind at N. N. W. Hd. from E. N. E. to East. At 4 P. M. Barometer 29.38. The gale at its height, from 5 P. M. to 9 P. M. Hd. N. E. to E. N. E. From 10 P. M. to midnight wind at West, Hd. from North to N. N. E. The gale blowing with great fury and heavy incessant gusts at intervals, ship labouring heavy and taking heavy lee lurches. The sea making a clean breach over all, Three sail in company under bare poles, worked the bolts that secure the tiller to the rudder head through. Barometer 29.55.

*Monday, May 5th.*—From 1 A. M. to 10 A. M. wind at S. W. Hd. from N. W. to W. N. W. Heavy gales and cloudy with rain and incessant gusts and a high sea on, vessel labouring heavy and taking fearful lee lurches. At daylight, 3 sail in company under bare poles, Barometer 29.64. At 8, the weather clearing up; at 11 A. M. the gale moderating; noon, strong gales and cloudy. Barometer 29.66; Latitude by account  $11^{\circ} 0'$  N.; Longitude by account  $81^{\circ} 43'$  East. P. M. gale decreasing and a high sea on, set mizen and fore topmast staysail at 6 P. M. The weather appearing more settled; at 8, made sail. Steering W. S. W. wind South. Midnight strong breeze and cloudy with a sea on; Barometer 29.84.

*Tuesday, May 6th.*—Latitude observed  $12^{\circ} 34'$  N.; Longitude  $80^{\circ} 56'$  East; P. M. steering W. S. W. wind at South fresh breezes and free; at





sunset made sail, sounded 28 fathoms, and came to at 1 p. m. on the 7th, in Madras Roads.

JOHN B. M. HARRIS, *Commander.*

*James Hall.*

*Extracts from the Log of the Ship Duke of Cornwall.*

*Thursday, May 1st.*—Unsettled appearance, Bar. setting to 29.65-75, wind Easterly veering to N. E. and N. N. E. latter part. Moderate cloudy weather.

*May 2nd.*—Strong breeze to N. N. E.; 11 a. m. signal made to shipping to send down T. G. yards and masts. Bar. 29.70; 8 a. m. falling to midnight 29.50 blowing hard and heavy rain, riding easy but heavy sea on. Midnight strong gales and heavy squall at N. N. E. Bar. 29.50; 3.30 a. m. the same, Bar. 29.48.

*May 3rd.*—6 a. m. signal made to slip (5 or 6 went) but we could not, having the Barque "*James Hall*" a cable's length to leeward of us and a heavy swell on to E. N. E. wind N. N. E. blowing fearfully in squalls. 8 a. m. Bar. 29.54; Noon 29.50 blowing fearfully in squalls. 3 p. m. Bar. 29.48. "*James Hall*" with 2 anchors down drifted a good distance from us. 4 p. m. Bar. 29.40; slipped, blowing fearfully at N. N. E. and a heavy swell to E. N. E. stood to the S. E. under storm trysails and double reefed fore topsail, our run up to Midnight 44' true S. E. by E. Midnight Bar. 29.38, blowing hard to North. Head to the Eastward.

*Sunday, May 4th.*—Midnight strong gales and heavy squalls, heavy sea on, ship labouring and straining much. 2 a. m. Bar. 29.38 wind N. N. W. the tiller broke; got the rudder head jammed in the trunk as quick as we could, but its surging had materially started head of the sternpost, kept the ship to under storm main trysail. 4 a. m. Bar. 29.30. Ship not keeping to well, being obliged to keep the rudder as much amidship as possible, on account of wrenching stern post more—paid the stream Hemp cable over the weather bow, with a long Teak fish spanned at the end of it, and kept to better. 5 a. m. had got a spar lashed on rudder head which helped it a little. 8 a. m. Bar. 29.20; blowing fearfully hard to N. W. and a confused sea on, rising in pyramids and heavy rain; 10 a. m. 29.25 (Noon 29.24; wind W. N. W.); 1 p. m. 29.18; 2 p. m. 29.18 (3 p. m. 29.5 minimum) wind West blowing awfully hard and a continued deluge of rain; 5 p. m. 29.10; 8 p. m. 29.14; wind W. S. W.; Midnight 29.30; wind W. S. W. a deal of lightning since 10 p. m. in the N. N. W. and blowing a fearful hurricane, harder since 10 p. m. than before I think, and the changes of wind preceded by a lull of 2 or 3 minutes. The decks in a deluge of water and shipping tremendous seas, ship in much distress.



*May 5th.*—2 A. M. Bar. 29.30; wind S. W. Port Tack; 4. 35 S. S. W.; 8, 29.40, trysail; Noon 29.50 South; 4 P. M. 29.55; 6, 29.62.; 10, 29.67.

Until 4 A. M. blowing terrific and a heavy confused sea. 8 A. M. more settled and no rain. Noon a hard squall and cloudy. No observation. Up to this time the drift about  $1\frac{1}{2}$  per hour.

2 P. M. more moderate, but blowing a hard gale, wind South; 3 P. M. during the afternoon succeeded in getting a very fair temporary filler on the rudder head; lying W. S. W. under fore, main and mizen storm trysail. 8 P. M. Lat. from indifferent observation  $12^{\circ} 20'$ ; Long. Jupiter  $81^{\circ} 49'$ . Midnight fresh gales to South, and more sea on, chiefly to W. No soundings with 75 F.

*Tuesday, May 6th.*—First part a hard gale to South veering at 4 A. M. to S. S. W. and cloudy with high sea on, it yet breaking over us. Bar. 4 A. M. 29.67; 8 A. M. 29.78; Noon 29.75; 8 A. M. hard gales to S. S. W.; Noon do.; the sea very confused. Obs. Lat.  $12^{\circ} 15'$ ; Long.  $81^{\circ} 15'$ ; 2 P. M. Bar. 29.70; 4 P. M. Bar. 29.70, wind S. S. W. strong but weather fine. 8 P. M. Bar. 29.75, wind S. by W. fresh and fine but sea on. Midnight Bar. 29.70, fresh wind South and fine. No bottom 75 F.

*Wednesday, May 7th.*—Midnight. Moderate and south and fine, Bar. 29.78. No bottom 70 F. 2 A. M. sounded in 53 F. 3 A. M. 47 F.; 4 A. M. 35; Daylight. Sadras Hills West; 7 A. M. Bar. 29.85. Moderate South winds and fine weather. 10 A. M. St Thomas' Mount N. W. wind Southerly light and fine, Bar. 29.80.

*Barque "Slains Castle."*

H.	K.	F.	Courses.	Winds.	Remarks—Saturday, May 3rd, civil time.
2			In Madras Roads.	North.	4 A. M. heavy gale with heavy rain and confused sea.
4					
6				N. b. E.	10 squalls increasing prepared for slipping.
8					
10					
12				North.	Noon slipped from anchor, wind N.
2					Heavy rain.
4			Sympiesometer.		P. M. do. wind; running off shore, E. S. E.
6			29.35 S.	North.	S. E. by E. S. E., S. E. by S. until 6 P. M.
8			29.375		Wind steady at N. hove too.
10				North.	
12			29.30		Midnight same weather in 60 fathoms.





H.	K.	F.	Sympiesometer.	Winds.	Remarks—Sunday, 4th May.
2					A. M. wind beginning to veer to W. in squalls, sea becoming like a boiling pot, vivid lightning accompanying the squalls, but no thunder heard.
4			29.20		
6					
8			29.20		
10			29.20	N. b. W.	Noon, very dark thick weather, wind veering rapidly.
12	11		29.125	N. W. b. N.	
2				N. W. b. W.	3 P. M. terrifically heavy squalls, with thunder and lightning immediately overhead.
4				W. b. N.	
6				W. b. S.	4, beginning to take off, but still blowing very hard.
8			29.325	W. S. W.	
10			29.525		
12			29.55	S. W.	Midnight still moderating.

During the height of the gale it was almost dark like very thick fog. Morning, observed a curious brick-red appearance in the sky.

I should suppose that I was, at the time of the height of the gale, about 100 miles S. E. by E. or S. E. of Madras.

From Midnight of May 4th, until 6 P. M. of May 5th gradually moderating, and sea becoming more regular. I then bore up under close reefed topsails and foresail and stood in to the Westward; my Bar. pumped so much that I could not depend on its indication.

Noon May 6th, made sail and at 4 made Sadras Hills, wind continuing steady from S. W.

May 8th, Noon, Sympiesometer 29.70, having risen since the height of the gale 575.

H. J. ANDREW,  
*Master of the Barque Slains Castle.*

To Captain C. BIDEN,

MY DEAR SIR,—I beg to send you an extract from the Barque *Aztec's* Log Book from the time of slipping from my moorings until my return into the Roads again, and have only to say that during my experience as a Commander for the last twenty-two years, I never experienced the elements to display so much confusion, and to blow with greater violence. Satur-



day May 2nd, Midnight increasing squalls with heavy rain, veered out 100 fathoms of cable, the Barometer standing 29.50, at 6, the signal guns were fired; heavy squalls at intervals, at 7 A. M. slipped from our moorings, and proceeded out to sea, the Barometer still on the decline. May 3rd, at 2 P. M. hove to under close reefed main topsail, Midnight hard gales with incessant squalls, wind due North, Barometer standing 29.20. May 4th, wind from N. N. W. to N. W. the gale still increasing, Barometer 29.00 5 P. M. furled the main topsail, the squalls still increasing and the Barometer still on the decline. Midnight the Barometer 28.80. May 5th, a perfect hurricane, wind West and the sea in a full state of illumination from the constant flashes of lightning, awful in the extreme, *I had all my sheep killed from the effects of the lightning*; at 4 A. M. the Barometer commenced to rise and the violence of the gale abated, Barometer 29.0. 8 A. M. the Barometer 29.10, the wind still subsiding, Noon strong winds, Barometer 29.30. May 6th, A. M. the weather still continuing to moderate made all sail for the Roads, the Barometer 29.50; at 6 P. M. came to an anchor in the Roads. During the heaviest of the gale I was in Latitude 12° 20' N. and Longitude 81° 12' E.

H. W. WRIGHT,  
*Barque Aztec.*

These remarks represent nautical time.

C. B.

*Madras, May 6th, 1851.*

Captain C. BIDEN,

MY DEAR SIR,—As you requested, I herewith send you an abstract of my log from slipping in Madras Roads on May 3rd instant, at 7 A. M. having perceived signals to do so from your department.

We proceeded to sea under double reefed topsails and foresail, after parting from 75 fathoms of chain, the wind then N. N. W.; at Noon wind the same, and eventually hove the ship to under a main staysail; at 4 P. M. on the 4th inst. until Midnight of the same date it blew a complete hurricane, the wind having suddenly shifted to W. S. W.; at 8 P. M. with heavy lightning and a turbulent sea at 4h. A. M. of the 5th, wind gradually decreasing and at Noon moderate, made all possible sail and stood in for land, the wind at South and S. S. W.; we had until our arrival again fine weather.

Farthest to the Eastward 81° 59' E.

Ditto Southward 12° 10' N.

Barometer during the heaviest of the gale 29.85.





The ship made excellent weather of it the whole time, splitting the topsail being the only mishap.

JOSEPH SWAN.

*Barque Sarah Swan, Madras Roads, May 9th, 1851*

May 8th 7h. P. M. Barometer 29.73.

10h. P. M. 29.77.

May 9th 7h. A. M. 29.78.

8h. A. M. 29.80.

11h. A. M. 29.79.

Memo.—As the standard Barometer at the Observatory was at 29.97; at 8 A. M. and the *Sarah Swan* at 29.80 this day .170 may be added to her Barometer when at its Minimum, viz.  $28.85 + .17$  which would give 29.02. as the indication of her Barometer during the height of the gale.

C. B.

*Ship William Fisher, Capt. Jones.*

To Captain BIDES, H. C. S.

SIR,—At 6-30 A. M. of the 3rd instant, having observed and answered your signal to the shipping, I slipped my cable and stood to the Eastward under close reefed topsails, reefed foresail, mizen main trysail, and fore-topmast staysail. My Barometer at that time 29.30; at noon, took in the foresail; the squalls at that time very heavy; Barometer 29.20; at 6 P. M. gale still increasing, wind steady at north: and, being then by account in Latitude  $12^{\circ} 52'$  North; Long.  $80^{\circ} 54'$  East, shortened sail. At 8 P. M. the weather cleared up a little, and, during the night it blew a steady gale from the Northward, Barometer still falling; at Noon of the 4th, Latitude by account  $12^{\circ} 27'$  North; Long.  $81^{\circ} 3'$  East. Although the squalls at times were violent, accompanied with heavy showers, had it not been for the Barometer, I should have thought the gale nearly ended. At 4 P. M. there was much less wind and drawing to the Westward; during the day and night previous, the vessel had not shipped any water, and the decks had been dry fore and aft, except during the short shower; but at this time, the water was perfectly smooth. Nevertheless the Mercury had fallen to 28.60,—the sea, though calm, was covered with milky foam, and the horizon was circumscribed with that dense murky haze which almost invariably precedes a heavy storm or hurricane, and which appeared to be closing on every side, and I took advantage of the lull to see my sails and every thing else well secured. At 6.30 P. M. a heavy gust of wind split the main trysail. It lasted about 20 minutes, and came without the least warning, and rained in torrents during that time: the wind at N. W.; at 8 A. M. by account Lat.  $12^{\circ} 22'$  N.; Long.  $81^{\circ} 14'$  E. Ship hove to, under





close reefed main topsail, gale from N. W. b. N. At 8.30, heavy rain, gale increasing; at 9 P. M. another sudden and furious gust literally burst the close reefed main topsail to ribbons, the rain fell in sheeted masses; and at 10 P. M. the thunder and lightning made another addition to the fierce collision of the elements. This lasted without intermission until 2 A. M. of the 5th: the wind had gradually hauled round to the Westward and thence to the S. W.; at that time I wore ship's head to the S. Eastward. By account Latitude  $12^{\circ} 34'$ ; Longitude  $81^{\circ} 18' E.$ ; at 4 P. M. wind and rain moderated a little, thunder and lightning ceased. Barometer rising; at 8, made sail, &c. Strong gale and cloudy weather;—at Noon, wind at South, more moderate, wore to the Westward; weather cloudy. No observation during the day, but from those obtained during the night and next day, my reckoning must have been very correct. Made the light-house bearing N. W. at noon of the 6th becalmed all the afternoon. The above dates are all civil time, and you will observe that the Mercury in my Barometer ranges much lower than that at your observatory, for which reason I have mentioned the height of mine in the Roads at 6.30 A. M. on the 3rd, The Thermometer during the four days remained nearly stationary at  $84^{\circ}$ ; a number of small land birds were blown on board and easily caught, sometimes several together on the afternoon of the 4th; and I observed several shoals of very large skate on the 3rd and 4th.

W. B. JONES,

*Commander, Ship William Fisher.*

*Madras Roads, May 16th, 1851.*

*May 4th.*—Noon Bar. 29.90; P. M. 2h. 28.80; 4, 28.70; 5, 28.60; 6, 28.70; 6.30 A. M. 28.60; \* 7, 28.70; 9, 28.70; 10, 28.80; 12, 28.80.

*May 5th.*—3 A. M. 28.80; 4, 28.90; 5, 29.00; 8, 29.10; Noon, 29.35.

*Extract from the Log of the Ship "Cressy," Capt. Bell. (Civil Time).*

<i>Days.</i>	<i>Hours.</i>	<i>Bar.</i>	<i>Ther.</i>	<i>Winds.</i>	<i>Remarks.</i>
May 3rd,—	2 A. M.	29.60	$79^{\circ}$	N. N. W.	At 4.35 signal at Mas-
	4 do.	29.52	79	do.	ter Attendant's flag to
	6 do.	29.55	79	do.	slip and stand to sea;
	8 do.	29.52	79	North.	repeated at daylight
	10 do.	29.55	80	do.	with red flag and swal-
	12 do.	29.60	80	do.	low tail and with guns
	2 do.	29.53	80	do.	from the Fort.
	4 do.	29.50	80	do.	
	6 do.	29.51	79	N. Easterly.	
	10 do.	29.55	79	do.	

\* At the Observatory at 6.41 the Barometer was 29.362.





	12 do.	29.50	79	do.	Slipped our cable at 6.45 under close reefed topsails and reefed fore-sail and stood away S. E. by E. blowing hard at North.
May 4th,—	2 A. M.	29.40	79	do.	Between 4 and 8 about
	6 do.	29.40	79	do.	p. m. on the 4th, wind
	10 do.	29.35	79	N. N. W.	about W. with furious
	12 do.	29.24	79	N. W.	squalls and heavy rain,
	2 P. M.	29.25	79	do.	a heavy cross sea run-
	4 do.	29.15	78	do.	ning constant, quick
	6 do.	29.10	78	W. N. W.	flashes of lightning all
	8 do.	29.35	78	do.	night.
	9 do.	28.98	78	do.	
	10 do.	29.03	78	West.	
	12 do.	29.10	78	do.	
May 5th,—	2 A. M.	29.25	78	do.	
	4 do.	29.34	79	do.	
	6 do.	29.40	79	do.	
	8 do.	29.50	79	S. Westerly.	
	12 do.	29.60	79	South.	
	2 P. M.	29.62	79	South.	
	4 do.	29.65	79	West.	
	6 do.	29.68	79	do.	
	10 do.	29.70	79	S. S. E.	
	12 do.	29.70	79	do.	
May 6th.—	2 A. M.	29.65	79	South.	Returned to the Ma-
	4 do.	29.60	79	do.	dras Roads at daylight
	8 do.	29.68	79	do.	on the 7th instant.
	12 do.	29.75	86	do.	

*Extract from the Log Book of the Ship Randolph, Wm. Dale Comr.  
forwarded by Capt. Biden.*

*May 3rd, 1851.*—At 6.15 A. M. saw the signal at the Master Attendant's flag staff to cut or slip, set the treble reefed topsails and slipped the cable and stood to the E. S. E. Strong breeze to the N. N. E. with hard squalls and heavy rain. At 10 A. M. kept away S. E. the gale increasing with heavy rain. At 6 P. M. hove to on the port tack under close reefed main topsail; Lat. by Acct.  $12^{\circ} 20' S.$ ; Long.  $81^{\circ} 00' E.$  At 7 P. M. the gale increasing with furious squalls, took in the main topsail. Midnight strong gale and heavy sea.

*May 4th.*—Wind North, blowing a heavy gale with violent squalls and heavy rain lying to under mizen trysail, the sea making from Westward and Bar. falling rapidly. Noon blowing a hurricane with a very high cross turbulent sea and heavy rain and lightning. The ship rolling heavily, her lee rail in the water; Noon Lat. by Acct.  $11^{\circ} 56' S.$ ; Long.  $81^{\circ} 10' E.$  The wind gradually drawing to the Westward. At 2 P. M. a heavy sea



struck the stern and washed away the boat. At 4 p. m. the wind S. W. blowing furiously with a tremendous sea. At 8 p. m. the hurricane abating, the Bar. rising; Midnight strong gale and heavy sea.

*May 5th.*—A. m. strong gale and high sea with hard squalls and rain at times. At 6 a. m. more moderate, set close reefed topsails; Noon strong gale and Southward and dark cloudy weather. The sea more regular. At 10 p. m. Lat. per Alt. of Jupiter  $12^{\circ} 7' S.$ ; Midnight fresh gale and clear weather, made sail.

*May 6th.*—A. m. fresh gale and clear, sea falling fast; at 12.30, brought up in Madras Roads.

*State of the Barometer during the Gale.*

		Bar.	Aneroid.	Symp.	Wind.
May 3rd,	6.30 A. M., .....	29.60	29.65	....	N. N. E.
"	Noon, .....	29.52	29.60	29.47	"
"	2 P. M., .....	29.44	29.55	29.40	"
"	6 " .....	29.44	29.53	29.39	"
"	10 " .....	29.44	29.52	29.39	"
"	Midnight, .....	29.40	29.45	29.35	"
May 4th,	4 A. M., .....	29.38	29.40	29.30	North.
"	8 " .....	29.33	29.40	29.30	N. W.
"	Noon, .....	29.20	29.33	....	W. N. W.
"	2 P. M., .....	29.10	29.25		
"	4 " .....	29.25	29.40	....	S. W.
"	8 " .....	29.33	29.50		
"	Midnight, .....	29.38	29.52		
May 5th,	4 A. M., .....	29.41	29.55		
"	8 " .....	29.55	29.70	....	Southerly.
"	Noon, .....	29.62	29.72		
"	Midnight, .....	29.70	29.80		

*Inland Notes by Capt. Biden.*

*May 5th to 6th.*—Vizagapatam—blowing a gale from N. N. E. to S. E. and South.

*May 5th to 6th.*—Bellary—from 4 p. m. from 5 to 8 a. m. 6th, gale with heavy rain.

*May 3rd.*—Guntoor—gale from Eastward.

*May 3rd to 6th.*—Secunderabad—heavy storms of wind but little rain.

*May 3rd.*—Chingleput—raining heavily till 10 a. m. of 5th, then heavy gale commencing at North and veering to East and South.



*Tabular View of the Winds and Weather experienced by the different Ships at Noon each day 30th April to 5th May, 1851.*

<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 30th April.	Diana.	0° 6'	86° 00'	S. W. to West.				
	Hannah.	7 50	82 8	Unsettled weather latterly. Off Ceylon.				
	Mary Ann.	9 49	81 34	Light and variable S. W. to North.	29.67 Aneroid .65	..	84°	Heavy rain at night.
	Sarah.	6 36	93 12	Fresh S. S. W. winds and fine.	...	..	..	Increasing to midnight, when cloudy with heavy squalls.
	Atalanta.	12 45	83 58	Light winds S. S. E. to S. E. with calms.	29.80			
	VIZAGAPATAM.	17 41	83 16	Light airs and sultry weather throughout.	29.80	..	..	Unusually clear weather.
1st May.	Disna.	1 56	86 20	Fresh breezes hard squalls and rain. Westerly increasing latterly.				
	Hannah.	8 40	81 43	Heavy and tremendous squalls W. S. W. and S. W.	...	..	..	Every appearance of a gale.
	H. M. S. Fox.	8 57	81 17	W. b. N. to W. N. W. variable.	29.67 to .74	..	82	Lightning.



<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 1st May.	Mary Ann.	10° 31'	81° 8'	Variable from Westward and North—rain.	29.60	..	81°	Night dull and oppressive.
	P. and O. Str. Precursor.	5 5	79 3	Strong winds W. b. S. Cloudy and frequent squalls. P. M. W. b. N.	29.70 to .82	..	..	Moderating on the 2nd in 3° 15' N. 78° 18' East.
	Joseph Manook.	10 30	81 8	Heavy dark appearance and much rain Wind W. N. W.	29.82 to .72 .78	..	82	Heavy N. W. squalls at Midnight.
	Ostrich.	14 19	82 45	E. N. E. and squally.	29.75	29.82	84	Squally at Midnight.
	Atlanta.	11 34	83 40	Smart squalls A. M. East to N. E. and N. N. W. Noon gloomy to Mid- night.	29.76 .66 and .75 to .70	..	..	Winds flying about N. N. W. to E. S. E. at Midnight and light- ning. Heavy bank to the South- ward.
2nd May.	VIZAGAPATAM.	17 41	83 16	Light airs N. W. and North to N. E. P. M. Northerly.	29.80 and .85	..	..	Long swell from the Eastward.
	Diana.	3 04	87 00	Wind W. b. S. to S. W. terrific squalls and de- luge of rain.	....	..	..	Current to the Eastward of 20' in the 24 hours.
	Hannah.	8 40	81 10	Gale increasing with tre- mendous squalls and rain. Wind Westerly veering about 2 points. each way.	....	..	..	Hove to.



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<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 2nd May.	H. M. S. Fox.	10° 0'	81° 38'	A. M. variable N. Noon N. N. W. P. M. hurri- cane. 8 P. M. W. N. W. to N. W. b. W.	29.67 Noon .60 Mid. .47	..	..	P. M. lying to.
	Mary Ann.	10 38	81 17	Strong gale variable N. N. E. to N. W. heavy rain.	29.52 .53 An.	..	82°	Night much heavy thunder and lightning to the Northward, 8 P. M. hove to.
	Joseph Manook.	10 40	81 3	Increasing from North, Noon blowing hard P. M. N. W. b. N. ; N. N. W.	29.79 .74 8 P. M. .64 12 .56	..	..	2 P. M. hove to.
	H. C. Str. Hugh Lindsay.	Off Porto Novo and Tranque- bar.	..	Threatening from the N. W.	29.69	..	..	Southerly, at anchor at Tranquebar.
	Paumbam Chan- nel.	..	..	9 P. M. hard gale N. N. W.	....	..	..	Wind veering frequently from S. W. to N. N. W.
	Ostrich.	13 10	83 10	8 A. M. East Noon E. N. E.	29.60	29.75	83	Midnight increasing gale and heavy squalls.
	Mary Harrison.	13 41	82 15	N. E. to N. b. W. and N. East.	29.60 to .50 and .40	.. Noon. Mid.	85½ to 83½	Heavy swell from S. E. and threat- ening appearances.



<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 2nd May.	Catherine Ap- car.	10° 44'	84° 14'	Dark cloudy and varia- ble and calms, 4 p. m. Eastward. Midnight hard squalls Easterly.	29.49 to 29.43	29.20 to 29.18	..	Making preparations for bad wea- ther.
	Atalanta.	10 46	81 41	A. m. squally N. N. W. to East 5 A. m. North 10 North to N. W. p. m. to 6, wind N. N. W. when shift to West.	29.64 to .61 p. m. .55 .51 .56	..	..	10 A. m. scudded to the South and S. S. W. Shift to W. N. W. and West; at 6 p. m. hove to, deluge of rain and scud.
	VIZAGAPATAM.	17 41	83 16	Light N. W. winds Noon dense horizon, p. m. the same.	29.80 and .78	..	..	Increasing swell from the East- ward.
3rd May.	Diana.	4 15	87 05	Fresh gale. Wind W. S. W. to S. W. b. S.	....	..	..	A. m. hove to, Noon moderate, made sail, 8 p. m. heavy gale.
	Hannah.	8 53	82 25	Hard gale from the Westward.	....	..	..	Moderating and towards midnight increasing again.
	H. M. S. Fox.	10 21	82 40	A. m. W. N. W. p. m. W. S. W. and S. W.	29.37 to 29.30 Noon .37 10 p. m. .50	29.20	..	9.45 obliged to bear up. Scudding to the Eastward to Midnight.
	Mary Ann.	....	...	Severe gale, heavy rain and terrific squalls. Wind W. to S. West.	29.30 to Noon .33 Mid. .30	..	..	Hove to throughout. Position not given.



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<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 3rd May.	Joseph Manook.	Not given.	....	A. M. N. W. blowing hard W. N. W. 9 West, violent gusts. Night W. to W. b. S.	29.48 to 29.44	..	..	5 A. M. but little wind, vessel not steering, heavy, confused sea; 7.30 heavy gust from N. W.
	H. C. Str. Hugh Lindsay.	....	....	Wind N. Westerly: gale.	29.40* to 29.58	..	..	Standing out to sea to Noon when bore to.
	Paumbum Channel.	....	....	S. W. hard gale.				
	Ostrich.	12° 46'	83° 00'	A. M. E. b. N. 8 East, Noon E. N. E. to Mid-night.	29.40	29.60	82°	Noon to Midnight continued and increasing squalls, rain and sea.
	Hyderabad.	14 05	83 47	P. M. strong breeze East-erly, 6 P. M. E. S. E.	28.90 to 28.80	..	..	Increasing with confused sea to Midnight. Ship standing to the S. S. W. and S. W.
	Mary Harrison.	13 12	81 28	North to N. N. W. squally weather.	29.38 to 29.30	..	83½	8 P. M. bore to.
	Catherine Ap-car.	12 40	83 32	2 A. M. E. S. E. P. M. fresh gale East.	29.33 to 29.29 and 29.50	29.12	..	5 A. M. bore up North, heavy squalls and cloudy but little sea; P. M. fresh gale and hard squalls.
	Atlanta.	Not given.	....	A. M. to Noon hurricane W. S. W. P. M. furious squalls W. S. W.	29.52 .60 .54	..	79	Midnight shifted to S. W.

\* Probably an error.



<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 3rd May.	VIZAGAPATAM.	17° 41'	83° 16'	Fresh N. W. winds. Noon North and N. E. and drizzling rain. Sunset sharp squalls and heavy rain.	29.78 to .72 and .69	..	..	Noon threatening to the N. E., high sea tumbling in from Eastward.
4th May.	Paragon.	17 00	83 15	A. M. squally from N. E. b. E. Noon strong gales and thick cloudy weather.	P. M. 29.67 to M. 29.66	29.66	..	Preparing for bad weather. .
	Diana.	4 50	86 50	W. S. W. to S. W. b. S. strong gale.	....	..	..	Ship partly hove to.
	Hannah.	9 00	83 00	Wind S. W. Midnight increasing.	....	..	..	Heavy cross sea.
	H. M. S. Fox.	10 22	84 35	A. M. S. S. W. Noon S. S. W. P. M. South to S. b. W.	29.57 to .70 Mid. .72	..	..	At 8 A. M. hauled up to N. West again.
	Mary Ann.	11 49* Acct.	82 34	Blowing a gale at 8 P. M. S. S. W.	29.38 .35 Mid. .40	..	82°	At 8 more moderate.
	Joseph Manook.	Not given.	....	Daylight more moderate Wind W. b. S. Mid-night South.	29.59 to .73			

\* So in MSS. but by the following day's Lat. and the wind, it is evident it should be 10° 49'.



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<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 4th May.	H. C. Str. Hugh Lindsay.	Not given.	....	Increasing at daylight to Noon. Wind Westerly to S. W.	29.50 to .57	..	..	Hove to moderating towards Mid- night.
	Paumbum Channel.	....	....	Gale at S. W.	...	..	..	Heavy sea though sheltered by the islands.
	Ostrich.	13° 4'	82° 21'	A. M. S. East strong gale Noon more moderate 2 E. S. E. Midnight S. E.	29.33	29.39	84°	From 8 P. M. to Midnight increas- ing.
	Hyderabad.	12 30	82 20	Wind S. E. b. E. from 6 A. M. 4 P. M. hurri- cane S. E. b. E. to East.	29.74 to 28.70	..	..	Decks swept continually, Wind hauling gradually to the South- ward.
	Mary Harrison.	12 41	81 38	A. M. North 8 A. M. N. N. W. 8 P. M. N. W. 10 P. M. S. W.	29.30 to 28.80	..	..	10 <sup>th</sup> P. M. shift to S. W.
	Catherine Ap- car.	15 13	82 56	8 A. M. fresh gales E. b. S. Wind E. to E. S. E. 9 P. M. S. East.	....	..	..	11 A. M. a terrific squall.
	Atalan'a.	Not given.	....	Noon, less violent gale from S. W. Midnight South and abating.	29.54 to .64 P. M. .64 to .70	..	..	10 <sup>th</sup> P. M. Lata. per Jupiter, and Spica give 10.46 <sup>h</sup> .



<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 4th May.	VIZAGAPATAM.	17° 41'	83° 16'	Baffling winds N. E. to East no increase. Weather thick and gloomy. P. M. drawing to E. S. E. in heavy squalls.	29.78 .75 .64	..	..	Much rain and lulls between the squalls P. M.
	Paragon.	16 24	83 26	Brisk gale N. E. b. E. 6 A. M. E. b. N. P. M. E. b. N. 10.30 S. E.	29.60 to .68	..	..	Lightning in the S. E. moderating at Midnight. Shift to S. E. at 10.30 P. M. High confused sea.
5th May.	Diana.	5 00	86 10	S. W. to S. S. W. strong gale.	....	..	..	Ship hove to for 16 hours since Noon late.
	Hannah.	9 40	81 50*	West 8 P. M. blowing hard.	....	..	..	Moderated about 8 A. M. on the 6th off Nagore.
	H. M. S. Fox.	10 25	83 55	South squally, but clearing up.	29.74 to .80	..	84°	Midnight fair.
	Mary Ann.	10 11	82 20	Moderating but heavy sea.	29.55 A. M. .55	..	84	Noon—made sail.
	Joseph Manook.	10 49	83 35	4 A. M. fresh gales South-erly; Noon South.	29.78 to .86	..	..	Current E. S. E. 160' since the last observation.
	H. C. Str. Hugh Lindsay.	9 59	81 49	Weather becoming fine.	29.52 to .70			

\* MSS. very badly written and possibly an error, H. P.



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<i>Date.</i>	<i>Name of Ship or Station.</i>	<i>Lat. N.</i>	<i>Long. East.</i>	<i>Winds and Weather.</i>	<i>Bar.</i>	<i>Symp.</i>	<i>Ther.</i>	<i>Remarks.</i>
1851. 5th May.	Paumbum Channel.	....	....	S. S. W. a gale but not so violent as before.				
	Ostrich.	14° 54'	82° 37'	A. M. S. S. E. strong gales.	29.26 Noon .60	29.31 .80	83°	6, Moderated and made sail. Mid- night—out reefs.
	Hyderabad.	12 50	81 40	Noon hard gales about S. E. b. S. r. m. more moderate.	28.71 to 28.80	..	..	Midnight more settled. On the 6th moderate.
	Mary Harrison.	13 11	81 50	Wind throughout S. S. W. to South.	28.80 to 29.58	..	82 to 83½	4 A. M. heaviest weather; 4.30, abating to a strong gale. On 6th, becoming fine.
	Catherine Ap- car.	16 42	84 25	Wind hauling to S. S. E. Noon fresh breeze.	29.67	29.46		
	Atalanta.	10 53	83 34	Moderate and fine.	29.75 to .80	..	..	Confused sea still running at Noon.
	VIZAGAPATAM.	17 41	83 16	Wind S. E. in hard squalls, heavy rain and thick dark weather. Sunset southerly, dense black clouds.	29.75 .68	..	..	Sea running fearfully high, and surf breaking as far as the eye could see. On the 6th clearing up.
	Paragon.	16 41	84 18	Strong breezes S. E. moderating at Noon.	29.70	..	..	Heavy sea from South.



## SUMMARY.

We find that on the 30th April the *Diana*, almost on the Equator, had a fresh S. W. to Westerly monsoon in Long.  $87^{\circ} 00'$  East; and that again from the meridian of the Coast of Coromandel to  $84^{\circ} 00'$  East and between  $6\frac{1}{2}^{\circ}$  to  $13^{\circ}$  North, the weather was fine with fresh to light and variable winds from the Southward. The Barque *Hannah* only, off the Coast of Ceylon, finds it becoming unsettled towards Midnight.

*On the 1st May.*—The *Diana* in about  $2^{\circ}$  North is bringing up a strong Westerly monsoon and from the meridian of Trincomalee ( $81^{\circ}$ ) to  $84^{\circ}$  East and between Trincomalee and  $11^{\circ}$  North Latitude; the *Hannah*, *H. M. S. Fox*, the *Mary Ann* and *Joseph Manook* have variable Westerly breezes and squally, but except threatening appearances nothing to indicate a Cyclone. The *Fox's* Barometer was *rising* (if this be not an error?) and that of the *Precursor* Steamer (to the W. S. W. of Ceylon) doing the same. The *Joseph Manook's* Barometer is fluctuating from 29.82 to 29.72 and then to 29.78. The Northernmost vessels of those above-mentioned are the *Mary Ann* and *Joseph Manook* in  $10\frac{1}{2}^{\circ}$  North. We have then, a degree farther to the North and  $1\frac{1}{2}$  degrees to the Eastward, the *Atalanta* in Lat.  $11\frac{1}{2}^{\circ}$ ; Long.  $83^{\circ} 40'$  and the *Ostrich* in  $14^{\circ} 19'$  to  $82^{\circ} 45'$  with squally gloomy weather from the E. N. Eastward, the *Atalanta's* Barometer *falling* from 29.76 to 29.70 in the 24 hours. The Easternmost ships have N. N. Westerly airs at times, but there is nothing again in all the records to indicate that a Cyclone had yet commenced in any part of the Bay. We have unfortunately no positions given in the Log of the *Sarah* except those of the 10th, when she was in the neighbourhood of the Nicobars and in  $6^{\circ} 36' N.$ , and  $93^{\circ} 12' East$ ; and of the 5th, when she was in  $10^{\circ} 40' N.$ , Long.  $86^{\circ} 10' East$ ; having had in these four days a heavy gale rising to a hurricane from S. S. W. and of this we cannot say if it was part of a Cyclone or the monsoon only. Its peculiarity of veering from South to S. W. I shall subsequently remark upon, she must on this day have been about  $10^{\circ}$  East of Trincomalee, and the *Diana* also at about  $10^{\circ}$  to the S. East had also an increasing monsoon gale from the S. Westward.



*On the 2nd May.*—We have on this day *H. M. S. Fox*, the *Mary Ann*, *Joseph Manook*, and *Atalanta* all within a short distance of each other, with smart gales and squalls more or less severe (that of *H. M. S. Fox* being of force 9) from N. N. W. to N. b. W. so that we may take the centre of the Cyclone, for it had now formed or *descended* as such, to have been bearing E. N. E. from a point in about the centre of their various positions. I, of course, assume the log of *H. M. S. Fox*, as being a perfectly correct one, but I do not lay down the centre as bearing exactly E. N. E. from her, though she had the wind at noon N. N. W. because it is one of the peculiarities of this Cyclone that the wind throughout is described as fluctuating as much as from four to six points with most of the ships, which I shall subsequently remark upon.

The Cyclone, however, was of very limited extent, for we find the *Catherine Apcar*, the log of which ship is perfectly well kept, at only 150 miles E. N. E. of *H. M. S. Fox*, with variable airs and calms, though the *Hannah*, 80 miles to the S. b. E. of the *Fox*, has an increasing gale with tremendous squalls, and the wind Westerly “varying two points each way.”

This estimate, for we can call it nothing better, will place the centre for this day in Lat.  $10^{\circ} 40'$  North, Long.  $82^{\circ} 25'$  East; but it gives the *Joseph Manook* and *Atalanta* the wind at North, while it is stated to have been N. N. W. by their logs; but then, as will be subsequently adverted to, the winds in this Cyclone appear to have been so unsettled, i. e. to have had so much incurving in the squalls, that it is impossible to lay down any positive centre from them.

*On the 3rd May.*—We have *H. M. S. Fox*, which ship had been standing to the N. Eastward (that is *into* the heart of the Cyclone,) as much as the gale allowed her, bearing up in a complete hurricane, at 9.45 A. M. to save her masts; and at Noon in Lat.  $10^{\circ} 21'$  N., Long.  $82^{\circ} 46'$  with the wind marked in the log W. S. W. at Noon, and W. N. W. at 7 P. M., a difference of 4 points in the hour, and it flies back again to W. S. W. at 3 P. M. ! Hence we can only take the average of West as representing the wind at Noon, but it was evidently very heavy, and the *Fox* was making very bad weather of it.

The next ship to her, the *Atalanta*, was also close on the South side of the centre, and though she had not the calm, yet her log describes



very remarkable alternations of lulls and gusts. Her position on this day is unfortunately not given, nor have I the detailed log to calculate it from, nor do the *Mary Ann* and *Joseph Manook* give their positions. The *Hugh Lindsay* also gives no position, but she was steaming out to sea with the wind N. W. and the *Hannah*, 87' miles South of the *Fox*, has a hard gale from the West. The *Joseph Manook* notes in her log a remarkable interval of calm about Noon, which may have been the centre; but her position is not given from the 1st to the 5th, so that we are quite at a loss to say if she really was at the centre, though with the strong Easterly current she experienced this is not impossible.

We have then to the N. N. Eastward of the *Fox* at 120 miles distance, the *Catherine Apcar* and *Ostrich*, with increasing gales from E. b. S. and E. N. E. and hard squalls, the first ship bound to Calcutta bearing up North to run as fast as possible out of the influence of the Cyclone. The *Mary Harrison*, 180 miles to the N. N. W. of the *Fox* and 75 to the Eastward of Madras, having the average of her winds about N. b. W. with squally weather, and at Madras the wind appears to have been variable between N. b. W. and N. N. E. and the weather sufficiently threatening for the ships in the roads to be ordered to sea at daylight.

These various winds do not give any certain position for the centre on the 3rd, but they establish clearly the existence of a Cyclone of irregularly blowing and *vibrating* winds, of which the centre must have been close upon the *Atalanta* and *H. M. S. Fox*, and upon the average parallel of the Southern group of vessels (*Atalanta*, *Fox*, *Joseph Manook*, *Mary Ann* and *Hugh Lindsay*,) and that the *Catherine Apcar*, *Ostrich* and *Hydrabad* were upon its Northern quadrants. The *Mary Harrison* (taking her position as correct) appears to have had her winds influenced by the shore, where indeed the winds on the approach of this Cyclone forcibly remind us of a Mexican *Norte*.

With these considerations, then, I have placed the centre for the 3rd May in Lat.  $11^{\circ} 08' N.$ ; Long.  $82^{\circ} 18' East$ , which will give it a track of 35 miles only to the N. N. E. in the twenty-four hours, but there is nothing extraordinary in the Cyclone's being so nearly stationary for one day, and *H. M. S. Fox* which only made good a course of N.  $73^{\circ} East$  71' miles, still reached only to the meridian of the centre



on the 3rd. The diameter of the Cyclone on this day cannot much have exceeded 220 to 250 miles, but its influence was beginning to be felt at 300 miles to the North by the *Paragon*; at Madras 190' to the N. W. ; and to the N. N. E. by the *Hydrabad* at about the same distance, and though the *Mary Harrison's* N. b. W. gale, (for she was hove to under a close reefed main topsail) is an anomaly, I have marked a circle for the *Hydrabad* and for Madras on this day.

*On the 4th of May.*—The centre on this day at Noon is perhaps best determined by the position of the *William Fisher*, which ship having slipped from Madras Roads on the 3rd, evidently met the centre at 4 p. m. and her reckoning being evidently most carefully kept (though it is not said if with any allowance for the current which sets so heavily along the coast in these gales), her position is probably nearer the truth than those of the *Mary Harrison*, *Ostrich* and *Hydrabad*, all of which were evidently close on the borders of the centre. Bearing in mind then that the *Mary Harrison* was probably farther to the S. W. perhaps as far as on the meridian of  $81^{\circ}$ ; and the *William Fisher* also a little farther to the South, we shall not be far wrong if we estimate the centre to have been about due West of the *William Fisher* or in Lat.  $12^{\circ} 30'$  N. ; and in Long.  $81^{\circ} 50'$  East; and that being closely followed up by the monsoon, of which it seems to have been a sort of precursor, the groups of ships to the Southward and S. Eastward of this spot, *Fox*, *Atalanta*, *Mary Ann*, and *Hannah* had the winds more Southerly than the exact quadrants of the Cyclone would allow them. The *Sarah* to the Eastward and the *Hannah* and *Diana* to the Southward seem both to have had the monsoon, but to the Northward and North Westward the influence of the Cyclone is seen in the Easterly winds of the *Catherine Apear* and *Paragon* and at Cocanada.

This position of the centre makes the Cyclone to have travelled up on a course of N.  $33^{\circ}$ ; West 100 miles in the 24 hours, and it agrees very fairly with the probable positions and the winds as stated in the logs of the ships which slipped from Madras Roads, so that it cannot be far wrong.

*On the 5th May,*—It would appear that on this day about 3 a. m. the Cyclone passed inland a little to the Northward of Madras, where we find the winds to have veered from N. West at Midnight to



W. N. W.; at 2h. 41' A. M. and W. S. W. at 3h. 41' A. M. giving us, as a mean, the wind at West (centre due North of Madras) at 3h. 10' A. M. The Bar. is marked as having reached the minimum of 29.316 at 5h. 36' A. M.; hence at Noon and no doubt because of the closely following monsoon, we find all the winds between S. E. b. S. and S. W. and we have no inland reports from which even approximately to deduce the position of the centre, if there was one, and it is not at all unlikely, that even the low range of the Pulicat hills over which the Cyclone must have passed was quite sufficient to make its various movements so irregular that but little could safely be set down except from a very considerable number of careful local reports such as are obtained in America or England. I am inclined indeed to think that its action was much disturbed in the neighbourhood of the land on account of the great discharge of lightning which took place with some of the ships.

If we take the centre of the Cyclone to have "landed" some 30 miles due North of Madras at 3 A. M., this will give it a course of N.  $56^{\circ}$  West, 115 miles for the 15 hours, from the place of the centre on the 4th, and for the 24h. will give 184 miles on the same course to Noon placing the centre in Lat.  $14^{\circ} 12'$ ; Long.  $79^{\circ} 49'$  As before remarked this acceleration of rate and change of course on the approach of the Cyclone to land is by no means new to us having been frequently traced before by authentic reports.

I have not thought it necessary to mark on the Chart the runs of the ships from Madras Roads; the positions of one or two for the 4th and 5th are given, being referred to in their logs.

There are some peculiarities in this Cyclone worth remarking upon and the first of these is the remarkable—

**VIBRATION OF THE WIND.**—We find this phenomenon to have occurred not when the ships were close to the centre where the incurving of the wind-spirals (like that of the arrows on the vignette of some of the Charts) is to be expected, but at a considerable distance from the centre and even before we can affirm the Cyclone to have truly commenced, and this again to have occurred with the same ship for several days. Thus taking the ships in the order they are set down in the Summary, we find on the 1st May the ships and winds as follows:—



## SHIP.

## WINDS.

<i>Hannah</i> , . . . . .	Tremendous squalls from W. and S. Westward.
<i>H. M. S. Fox</i> , 1 P. M. . .	Variable W. b. N. to W. N. W.
<i>Mary Ann</i> , 4 P. M. . . . .	Variable West and North.
<i>Sarah</i> , near the Nicobars, 4 P. M. . . . .	Heavy gusts from South to S. W.
<i>Atalanta</i> , 9 P. M. . . . .	Smart squalls, at Sunset, East to N. E. and N. N. W.
MAY 2ND. <i>Hannah</i> , 4 P. M.	Wind Westerly (heavy gale) veering about two points each way.
<i>H. M. S. Fox</i> , 7 P. M. . .	Variable from North to W. b. N.; P. M. hurricane.
<i>Mary Ann</i> , 6 P. M. . . . .	Strong gale, very variable from N. N. E. to N. W.
<i>Sarah</i> , 4 P. M. . . . .	Heavy gusts South to S. W.
<i>Mary Harrison</i> , 5 P. M. . .	N. b. W. to N. East.
<i>Atalanta</i> , 4 P. M. . . . .	Heavy gusts North to N. W.
<i>At Paumbaum</i> , 10 P. M. . .	Gusts from S. W. to N. N. W.

On the 3rd May,—The *Hannah*, *H. M. S. Fox* and the *Joseph Manook* being close in upon the centre seem to have had the wind veering with tolerable steadiness and not vibrating as before.

*Sarah*, 4 P. M., successive heavy squalls from S. to S. W. are marked.

*Atalanta*, frequent lulls of two to five minutes followed by furious gusts, direction not given.

The ships putting to sea from Madras Roads do not seem to have experienced any vibration of the wind worth noting, and many of those mark it as "steady at North, &c." As upon an average we may say that the centre of the Cyclone passed at about 30 or 40 miles from the whole of these ships, it would appear from this and from what we have extracted above, either that this vibration occurred towards the outskirts of the Cyclone and towards the S. W. where it may have been owing to the heavy monsoon, which was evidently following up the Cyclone, or that it occurred more at its commencement while it was settling down. The fact, however, whatever may have been the cause, is highly worthy of notice amongst other yet unexplained ones.





**THE MANAGEMENT OF THE SHIPS.** Those which were at sea scarcely require any comment, their errors, or good management, being so clearly seen from their logs and the Charts. H. M. S. *Fox* seems to have paid most severely for running too far in towards the centre. The ships in Madras Roads, however, furnish very instructive lessons. They all ran out more or less upon a wind, evidently to get an offing, forgetting that in so doing, they were risking the chances of meeting with the centre, by which if dismasted and thrown into the Northern quadrants, or as in the case of the *Runnimede* and *Briton* (12th Memoir; Journal, Vol. XIII.) if involved in it, they might have been carried by it like helpless hulks on shore again. Whereas by steering from a point to two or three points more to the Southward they would rapidly have brought the wind to the Northward and to the Westward of North, so as safely and easily to *run round* the Cyclone and so return to their anchorage without straining a rope-yarn. The direction of the wind and the fall of the Barometer were infallible guides for them.

**THE BAROMETRIC INDICATIONS.** These are also of very great interest, but as I have already prepared one paper upon them embodying through the aid of our new Science of Cyclonology a discovery which I think will be considered as one of much importance by Meteorologists, and this will probably be followed by another, I will not here anticipate upon what I may have to say in those papers.

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*An account of the Table used for reducing Barometrical Observations to 32° Fahrenheit, taken in the Surveyor General's Office, Calcutta. By Bábu RÁDHÁNÁTH SICKDHAR, chief Computer, Great Trigonometrical Survey of India. Communicated by the Deputy Surveyor General.*

The observed heights of a Barometer taken at different temperatures, before they can be compared with each other, will require reduction to one common temperature. The reduction consists of two parts, one part being due to the dilation of the mercury, and the other to that of the brass scale attached to the Barometer. Both these corrections stand embodied in the following formula.

$$C = B. \frac{(t - 32^\circ) m - (t - 62^\circ) b}{1 + (t - 32^\circ) m}$$

C = Sum of the two corrections.

B = Observed height of the Barometer.

t = { Observed temperature of the mercury, and of the  
brass scale which are assumed to be equal.

m = .000100 Expansion of mercury for 1° of Faht.

b = .0000106 Expansion of brass for 1° of Faht.

32° = Standard temperature of mercury.

62° = Ditto ditto of brass.

The formula for C given above, is the same as that which Col. Boileau makes use of in the computation of his Table XI. referring his readers to p. 67 of Galbraith's Tables Edit. 1834, where he says the formula will be found.\* Col. Boileau has given no demonstration of the process. Galbraith may have done so, but as the works of the latter are not within my reach, I have been necessitated to satisfy myself of the truth of the formula by the following investigation.

Now (B—C) is the observed Barometrical height reduced to 32°.

Taking this corrected height and multiplying it by the factor (t—32°) m, there will result the correction due to the expansion of the mercury. This correction therefore is of the following form—(B—C) (t—32°) m, in which the *corrected* height of the Barometer

\* Vide p. IX. of Introduction to Boileau's Table 1849.





enters as a factor, because it is that which expanded produces the observed mercurial column B.

In like manner the correction for the dilation of the brass scale will be found to be of the form  $+ B. (t - 62^\circ) b$ , which is additive, because the mercurial column measured by the expanded scale being B, it would be more, or  $B + B. (t - 62^\circ) b$  if the scale remained unaltered by temperature.

Combining the corrections for mercury and brass according to their signs, there will arise the following equation.

$$- C = - (B - C) (t - 32^\circ) m + B (t - 62^\circ) b$$

which solved in the usual manner will give

$$C = B. \frac{(t - 32^\circ) m - (t - 62^\circ) b}{1 + (t - 32^\circ) m}$$

which formula has accordingly been made use of in the computation of the following Table.

The arrangement and use of the Table will be best understood from the following example.

Suppose it is required to compute the correction for Barometer 29.780 inches and Thermometer  $83^\circ.3$ .

The Tabular number for 29.8 Fahrenheit, .....	.145
Alteration for $0^\circ.3$ Fahrenheit deduced by the common rule of proportion, .....	} .001
<hr/>	
Required correction, .....	.146
Observed height of the Barometer, .....	29.780
<hr/>	
Height reduced to $32^\circ$ Fahrenheit, .....	29.634
<hr/>	

It will be remembered that the Tabular correction is always *negative*.



*Table shewing the correction to be applied to a Barometer with a Brass Scale, extending from the Cistern to the Top of the Mercurial Column, to reduce the observation to 32° Fahrenheit.*

Temperature Fahrenheit.	OBSERVED HEIGHTS OF THE BAROMETER IN INCHES.											
	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	29.0	29.1	29.2
50°	.054	.054	.054	.055	.055	.055	.055	.055	.056	.056	.056	.056
51	.057	.057	.057	.057	.057	.058	.058	.058	.058	.058	.059	.059
52	.059	.059	.059	.060	.060	.060	.060	.061	.061	.061	.061	.061
53	.062	.062	.062	.062	.062	.063	.063	.063	.063	.064	.064	.064
54	.064	.064	.065	.065	.065	.065	.065	.066	.066	.066	.066	.067
55	.067	.067	.067	.067	.068	.068	.068	.068	.068	.069	.069	.069
56	.069	.069	.070	.070	.070	.070	.071	.071	.071	.071	.072	.072
57	.072	.072	.072	.072	.073	.073	.073	.073	.074	.074	.074	.074
58	.074	.074	.075	.075	.075	.075	.076	.076	.076	.076	.077	.077
59	.077	.077	.077	.077	.078	.078	.078	.078	.079	.079	.079	.080
60	.079	.079	.080	.080	.080	.080	.081	.081	.081	.082	.082	.082
61	.082	.082	.082	.082	.083	.083	.083	.084	.084	.084	.084	.085
62	.084	.084	.085	.085	.085	.086	.086	.086	.086	.087	.087	.087
63	.087	.087	.087	.087	.088	.088	.088	.089	.089	.089	.090	.090
64	.089	.089	.090	.090	.090	.091	.091	.091	.092	.092	.092	.093
65	.092	.092	.092	.093	.093	.093	.093	.094	.094	.094	.095	.095
66	.094	.094	.095	.095	.095	.096	.096	.096	.097	.097	.097	.098
67	.097	.097	.097	.098	.098	.098	.099	.099	.099	.000	.100	.100
68	.099	.099	.100	.100	.100	.001	.001	.001	.002	.002	.103	.103
69	.102	.102	.102	.003	.103	.003	.004	.004	.004	.005	.105	.105
70	.104	.104	.105	.105	.105	.006	.006	.007	.007	.007	.108	.108
71	.106	.107	.107	.108	.108	.008	.009	.009	.010	.010	.110	.111
72	.109	.109	.110	.110	.111	.011	.011	.012	.012	.012	.113	.113
73	.111	.112	.112	.113	.113	.013	.014	.014	.015	.015	.115	.116
74	.114	.114	.115	.115	.116	.016	.016	.017	.017	.018	.118	.118
75	.116	.117	.117	.118	.118	.019	.019	.019	.020	.020	.121	.121
76	.119	.119	.120	.120	.121	.021	.021	.022	.022	.023	.123	.124
77	.121	.122	.122	.123	.123	.024	.024	.024	.025	.025	.126	.126
78	.124	.124	.125	.125	.126	.026	.027	.027	.027	.028	.128	.129
79	.126	.127	.127	.128	.128	.029	.029	.030	.030	.030	.131	.131
80	.129	.129	.130	.130	.131	.031	.032	.032	.033	.033	.133	.134
81	.131	.132	.132	.133	.133	.034	.034	.035	.035	.036	.136	.137
82	.134	.134	.135	.135	.136	.036	.037	.037	.038	.038	.139	.139
83	.136	.137	.137	.138	.138	.039	.039	.040	.040	.041	.141	.142
84	.139	.139	.140	.140	.141	.041	.042	.042	.043	.043	.144	.144
85	.141	.142	.142	.143	.143	.044	.044	.045	.045	.046	.146	.147
86	.144	.144	.145	.145	.146	.046	.047	.047	.048	.048	.149	.149
87	.146	.147	.147	.148	.148	.049	.049	.050	.050	.051	.152	.152
88	.149	.149	.150	.150	.151	.051	.052	.052	.053	.054	.154	.155
89	.151	.152	.152	.153	.153	.054	.054	.055	.056	.056	.157	.157
90	.154	.154	.155	.155	.156	.056	.057	.058	.158	.059	.159	.160
91	.156	.157	.157	.158	.158	.059	.060	.060	.161	.061	.162	.162
92	.159	.159	.160	.160	.161	.062	.062	.063	.163	.064	.164	.165
93	.161	.162	.162	.163	.163	.064	.065	.065	.166	.066	.167	.168
94	.164	.164	.165	.165	.166	.067	.067	.068	.168	.069	.169	.170
95	.166	.167	.167	.168	.169	.069	.070	.070	.171	.071	.172	.173
96	.169	.169	.170	.170	.171	.072	.072	.073	.173	.074	.175	.175
97	.171	.172	.172	.173	.174	.074	.075	.075	.176	.077	.177	.178
98	.174	.174	.175	.175	.176	.077	.077	.078	.179	.079	.180	.180
99	.176	.177	.177	.178	.179	.079	.080	.080	.181	.082	.182	.183
100	.179	.179	.180	.180	.181	.082	.082	.083	.184	.084	.185	.186
101	.181	.182	.182	.183	.184	.084	.085	.086	.186	.087	.187	.188
102	.184	.184	.185	.185	.186	.087	.087	.088	.189	.089	.190	.191
103	.186	.187	.187	.188	.189	.089	.090	.091	.191	.092	.193	.193
104	.188	.189	.190	.190	.191	.092	.092	.093	.194	.094	.195	.196
105	.191	.192	.192	.193	.194	.094	.095	.096	.196	.097	.198	.198
106	.193	.194	.195	.195	.196	.097	.098	.098	.199	.200	.200	.201
107	.196	.197	.197	.198	.199	.099	.200	.201	.201	.202	.203	.204
108	.198	.199	.200	.200	.201	.202	.203	.203	.204	.205	.205	.206
109	.201	.202	.202	.203	.204	.204	.205	.206	.207	.207	.208	.209
110	.203	.204	.205	.205	.206	.207	.208	.208	.209	.210	.211	.211





Table showing the correction to be applied to a Barometer with a Brass Scale, extending from the Cistern to the Top of the Mercurial Column, to reduce the Observation to 32° Fahrenheit.

Temperature Fahrenheit.	OBSERVED HEIGHTS OF THE BAROMETER IN INCHES.											
	29.3	29.4	29.5	29.6	29.7	29.8	29.9	30.0	30.1	30.2	30.3	30.4
50°	.056	.057	.057	.057	.057	.057	.058	.058	.058	.058	.058	.058
51	.059	.059	.059	.060	.060	.060	.060	.060	.061	.061	.061	.061
52	.062	.062	.062	.062	.062	.063	.063	.063	.063	.063	.064	.064
53	.064	.064	.065	.065	.065	.065	.066	.066	.066	.066	.066	.067
54	.067	.067	.067	.067	.068	.068	.068	.068	.069	.069	.069	.069
55	.069	.070	.070	.070	.070	.071	.071	.071	.071	.072	.072	.072
56	.072	.072	.073	.073	.073	.073	.073	.074	.074	.074	.074	.075
57	.075	.075	.075	.075	.076	.076	.076	.076	.077	.077	.077	.077
58	.077	.077	.078	.078	.078	.079	.079	.079	.079	.080	.080	.080
59	.080	.080	.080	.081	.081	.081	.081	.082	.082	.082	.083	.083
60	.082	.083	.083	.083	.084	.084	.084	.084	.085	.085	.085	.086
61	.085	.085	.086	.086	.086	.086	.087	.087	.087	.088	.088	.088
62	.088	.088	.088	.089	.089	.089	.089	.090	.090	.090	.091	.091
63	.090	.091	.091	.091	.091	.092	.092	.092	.093	.093	.093	.094
64	.093	.093	.093	.094	.094	.094	.095	.095	.095	.096	.096	.096
65	.095	.096	.096	.096	.097	.097	.097	.098	.098	.098	.099	.099
66	.098	.098	.099	.099	.099	.100	.100	.100	.101	.101	.101	.102
67	.101	.101	.101	.102	.102	.102	.103	.103	.103	.104	.104	.104
68	.103	.104	.104	.104	.105	.105	.105	.106	.106	.106	.107	.107
69	.106	.106	.107	.107	.107	.108	.108	.108	.109	.109	.109	.110
70	.108	.109	.109	.110	.110	.110	.111	.111	.111	.112	.112	.113
71	.111	.111	.112	.112	.113	.113	.113	.114	.114	.114	.115	.115
72	.114	.114	.114	.115	.115	.116	.116	.116	.117	.117	.118	.118
73	.116	.117	.117	.117	.118	.118	.119	.119	.119	.120	.120	.121
74	.119	.119	.120	.120	.120	.121	.121	.122	.122	.122	.123	.123
75	.121	.122	.122	.123	.123	.124	.124	.124	.125	.125	.126	.126
76	.124	.124	.125	.125	.126	.126	.127	.127	.127	.128	.128	.129
77	.127	.127	.127	.128	.128	.129	.129	.130	.130	.131	.131	.131
78	.129	.130	.130	.131	.131	.131	.132	.132	.133	.133	.134	.134
79	.132	.132	.133	.133	.134	.134	.135	.135	.135	.136	.136	.137
80	.134	.135	.135	.136	.136	.137	.137	.138	.138	.139	.139	.139
81	.137	.137	.138	.138	.139	.139	.140	.140	.141	.141	.142	.142
82	.140	.140	.141	.141	.141	.142	.142	.143	.143	.144	.144	.145
83	.142	.143	.143	.144	.144	.145	.145	.146	.146	.147	.147	.148
84	.145	.145	.146	.146	.147	.147	.148	.148	.149	.149	.150	.150
85	.147	.148	.148	.149	.149	.150	.150	.151	.151	.152	.152	.153
86	.150	.150	.151	.151	.152	.153	.153	.154	.154	.155	.155	.156
87	.153	.153	.154	.154	.155	.155	.156	.156	.157	.157	.158	.158
88	.155	.156	.156	.157	.157	.158	.158	.159	.159	.160	.160	.161
89	.158	.158	.159	.159	.160	.160	.161	.161	.162	.163	.163	.164
90	.160	.161	.161	.162	.163	.163	.164	.164	.165	.165	.166	.166
91	.163	.163	.164	.165	.165	.166	.166	.167	.167	.168	.168	.169
92	.165	.166	.167	.167	.168	.168	.169	.169	.170	.171	.171	.172
93	.168	.169	.169	.170	.170	.171	.172	.172	.173	.173	.174	.174
94	.171	.171	.172	.172	.173	.174	.174	.175	.175	.176	.176	.177
95	.173	.174	.174	.175	.176	.176	.177	.177	.178	.179	.179	.180
96	.176	.176	.177	.178	.178	.179	.179	.180	.181	.181	.182	.182
97	.178	.179	.180	.180	.181	.181	.182	.183	.183	.184	.185	.185
98	.181	.182	.182	.183	.183	.184	.185	.185	.186	.187	.187	.188
99	.184	.184	.185	.185	.186	.187	.187	.188	.189	.189	.190	.190
100	.186	.187	.187	.188	.189	.189	.190	.191	.191	.192	.193	.193
101	.189	.189	.190	.191	.191	.192	.193	.193	.194	.195	.195	.196
102	.191	.192	.193	.193	.194	.195	.195	.196	.197	.197	.198	.199
103	.194	.195	.195	.196	.197	.197	.198	.199	.199	.200	.201	.201
104	.197	.197	.198	.199	.199	.200	.201	.201	.202	.203	.203	.204
105	.199	.200	.200	.201	.202	.202	.203	.204	.205	.205	.206	.207
106	.202	.202	.203	.204	.204	.205	.206	.206	.207	.208	.209	.209
107	.204	.205	.206	.206	.207	.208	.208	.209	.210	.211	.211	.212
108	.207	.208	.208	.209	.210	.210	.211	.212	.212	.213	.214	.215
109	.209	.210	.211	.212	.212	.213	.214	.214	.215	.216	.217	.217
110	.212	.213	.213	.214	.215	.216	.216	.217	.218	.218	.219	.220





*Notes on Dust Whirlwinds and Cyclones. By P. F. H. BADDELEY, Esq., M. D., Bengal Artillery, Lahore.*

(As an Appendix to his last paper,—*ante p.* 264.)

1.—My experience of the smaller dust whirlwinds leads me to believe, that they travel *uninfluenced* by the direction of the prevailing surface wind which may have been blowing prior to their appearance, and indeed, they often come up from an opposite point of the compass.

If they are, as I am certain is the case, *themselves the exciting cause of wind*, the reason of this is obvious.

2.—They rarely deviate materially from their original course, though they commonly progress, more or less, in a wavy line ;—now on one side of the path, and now on the other.

3.—They turn indifferently from left to right, or from right to left, and their rotatory motion sometimes seems suddenly reversed—though this may be only an optical illusion.

4.—During strong winds, and in stormy weather, the spiral columns, though in full force, are not easily recognisable, even when passing over a light, dry soil ; and would be entirely unnoticed by most persons.

5.—When numerous, they are frequently observed advancing in a line ; and after passing the observer, an interval of some minutes may elapse before another set is seen in the distance—and so they continue—one set succeeding another, giving rise to squalls and lulls, or rising and falling of the wind.

6.—Their rate of progression is liable to great variety—being sometimes retarded and then again accelerated, without apparent cause : but in a brisk wind their progress is more uniform.

7.—They appear with great regularity between, though sometimes a little before and after, the hours of 10 A. M. and 4 P. M., increasing in frequency with the heat of the day, and declining as the sun approaches the western horizon :—ceasing altogether before sun-set, when the wind drops.

From the fact of their appearing in greatest numbers during the



hottest hours of the day, it would seem that the solar influence may be considered at least a subordinate cause in bringing them into action.

8.—The winds caused by the passage of whirlwinds, or electromagnetic spirals through the air, are characterized by gusts or flaws, succeeded by lulls, and are of a totally different description from the winds caused by variations in temperature, or by the rotation of the earth on its axis.

9.—The dust whirlwinds are usually composed of many single spirals joined together; these may separate and reunite again with augmented power.

10.—They preserve a distinct columnar form to the height of three thousand feet and upwards, and terminate in a cloud of dust, which still possesses a gyrating motion, ascending higher and higher.

11.—A dust column or pillar of that height is sometimes observed broken in its ascent into two or three lengthened irregular patches of dust, with perfectly clear intervening spaces; the dust all the while ascending with rapidity into the higher regions, as if the electrically charged pillar were endued at times with an increased centrifugal force.

12.—Their rate of upward ascent is subject to variation, as well as their onward motion.

13.—A lofty dust column, moving slowly, may sometimes be seen to assume, in the course of a few seconds, a wavy, and slightly contorted appearance in its vertical section, while still preserving its exact cylindrical form; the change being effected simultaneously throughout its entire height.

14.—Kites, (which are numerous in this part of the country) often follow the dust whirlwinds for some distance, soaring about and around it, diving at each other, as if in sport; and, seemingly, with no other purpose, than that of enjoyment.

15.—Evaporation is much increased when the whirlwinds are frequent and the wind brisk.

16.—In damp weather, the passage of the electrical spirals over an insulated wire, fails to affect the gold leaf electrometer—and during this humid state of the atmosphere, the electrometer can only be excited with difficulty, and loses power the moment the excitement is removed.



17.—Once, when observing the peculiar motions of a well defined slender dust pillar, rotating briskly, but at the same time remaining almost stationary on the one spot, and while looking upwards at the body of the column, with the view of understanding the particular course the dust was taking in its ascent, the pillar was suddenly withdrawn, or lifted upwards, and carried out of sight—and this occurred so suddenly as to give the impression of its having been divided asunder; particularly as the outer stratum of dust remained for a few moments suspended in the air—but, on again directing the eye to the earth, the absence of the rotatory motion and of the cone of dust, at once explained the real state of the case.

18.—In March last, during unsettled stormy weather, my attention was directed to a large mass of dust whirlwinds to the Northward, moving from West to Eastward—all at once, their course was entirely changed—and they were seen coming back from N. E. to S. W.

This strange and sudden shift, may perhaps be explained, by supposing that the mass of spirals moving in a cycloidal course, recurved at that particular time.

19.—I once followed, for more than a mile, a dust whirlwind of about four or five feet in diameter, travelling at the rate of seven or eight miles an hour, and rotating from right to left (C). After a time, its progress was retarded, so as to enable me to penetrate to the centre, and to walk slowly with it for a short distance. The centre was perfectly calm, while, round about, the wind was blowing in every direction. Though surrounded by dust, I was enabled, by keeping my eye fixed upon the whirling line of dust at my feet, as it continually swept past me on the right, (the side of progression,) to preserve my position in the central calm space, for some little time, without being inconvenienced by the dust. On the left hand side of the whirl, the dust was not so well defined, but cloudy and confused.

There was in this case, as in all others of a similar kind, a trail of dust closely following, occasioned by the action of the whirlwind upon the air.

20.—Westerly winds, or rather West South West winds, seem almost invariably to prevail at Lahore at the height of three or four miles above the Earth's surface—in the region of Cirro Stratus and Cirrus.

When clouds prevail, with fine weather, they usually clear off about



sun-set, with the greatest regularity, when they are observed progressing Eastward, from the West, with considerable velocity, which would lead to the supposition that, at this height, the prevailing currents, when not disturbed are always in that direction—the same thing is often observed at sun-rise, only *then*, the clouds come up from the West, and continue to increase for a time.

21.—The peculiar manner in which the winds blow after a whirlwind of small diameter and swift progressive motion, is somewhat remarkable, and deserves attention. Plant yourself in the direct line of an advancing whirlwind, and allow it to blow over you. After it has passed, there will generally be perceived more or less of a lull, or the winds blowing in the direction of the track will be found light and unsteady. This may continue for a minute or more, by which time the whirlwind may have travelled onwards 150 or 200 yards. All at once, the breeze freshens and blows steadily and with increased force for a lengthened period; after which, it may drop and then again revive for a shorter period, becoming again unsteady, and by degrees fainter, and then ceasing altogether. Though I have frequently remarked the fact, I am not prepared to account for it, further than to remark, that the light unsteady winds at first may be occasioned by eddies caused by the rotatory action of the whirlwind on the air more immediately adjacent, while the stronger winds may be the oblique currents on either side of the track, meeting on the line, and combining to produce increased power and velocity.

More exact observations however are requisite to enable one acquainted with the theory of the motion of fluids to determine the real cause of this striking phenomenon.

22.—When whirlwinds are moving about, white patches of Cirro-Cumuli are frequently seen on the clear blue sky, exactly resembling flakes of teased cotton—having a rotatory motion throughout—forming, and then rapidly dissolving, or ascending with whirling motions into the higher regions, becoming more and more faint as they recede from the sight.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL.  
FOR APRIL, 1852.

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The usual monthly meeting of the Society was held on Wednesday the 17th instant, at half-past 8 P. M.

1. SIR JAMES COLVILE, *President*, in the Chair.

In the absence of Dr. Sprenger, the Secretary, on public business, Mr. Beadon undertook to officiate for him.

The Proceedings of the last meeting having been read, and an alteration in the note quoad Mr. Bayley's letter having been adopted, the former were confirmed.

Read a letter from Capt. Layard forwarding for exhibition seven silver and twenty copper coins, found in and about Gour. The following is an extract from Capt. Layard's letter :—

“ During my late visit to the ruins of Gour, and her sister city—Pandooa or Parwa, in January and February last, my particular enquiries were directed to the procuring of such coins, gold, silver and copper, as are occasionally dug up by brick-diggers in their search for material for constructing houses at Malda and the surrounding bazars. Knowing the dread these people have of allowing any one to suppose them possessed of treasure, I was cautious in my search. The rewards of my labours have been the few copper coins, twenty in number, which I now send you. For the seven silver coins accompanying, I am indebted to Mr. Gray of Goamutty Factory, who most kindly allowed me to select them from duplicates in his possession. This gentleman has upwards of a hundred silver coins, collected during his residence in Gour, and intends, I believe, submitting them some day for identification to the Asiatic Society.



"The coins, principally of silver found in Gour, are very numerous, but I regret to say, so little numismatic taste or historical enquiry, apparently, exists amongst the resident planters and others in the district, that old coins, which have been brought to them by ryots in exchange for the new ones, and which might have led to important dates in the history of by-gone ages, have not only been melted down into ornaments and jewellery of different kinds, but fashioned up into tea-pots and shaving mugs.

"The accompanying silver coins were all found in Mussulman-Gour, and, I should say, may easily be deciphered with the assistance of Mr. Laidley's key to the coins of the kings of Bengal, published in one of the numbers of the Journal, which I have not by me to refer to.

"No. 1, appears, by its Sanscrit legends surrounded by the Arabic characters, to belong to one of the Delhi Emperors: the rest from No. 2 to No. 7, seem to be of Hussein Shah and his son and successor Nusserit Shah.

"I have used above, the expression Mussulman-Gour, in contradistinction to Hindu-Gour, which I feel inclined to think commenced a few miles to the North of the existing high bunds or ramparts at a village called Gungerampore, bordered by the Kalindra River: from thence I procured the copper coins from No. 1 to No. 12 in packet A.

"The tide of Mussulman robbery and spoliation seems to have rolled southwards from Gungerampore to a nullah near the village of Púkeria, carrying with it the desecrated ruins of many noble Hindu temples and palaces, to raise mosques and shrines dedicated to the iconoclastic bigotry and intolerance of the religion of the Prophet.

"Of Hindu-Gour as a city, nothing remains above ground."

*List of Silver Coins (7).*

No. 1st.	Delhi Emperor—date A. M. 962?
" 2nd.	Hussein Shah (?)
" 3rd.	Date A. H. 794 temple Jelalloddeen (?)
" 4th.	Nusserit Shah (?)
" 5th.	Hussein Shah (?)
" 6th.	Ditto (?)
" 7th.	Same as No. 5th.



*List of Copper Coins found at Gungarampore, Packet A, (12)*

No. 1st. Fuckeerooddeen (?) 742.

„ 2nd, 3rd, 4th. (?)

„ 5th and 6th. Doubtful as to antiquity, but found in the foundation of a house.

„ 7th and 8th. Ditto.

„ 9th and 10th. Ditto.

„ 11th. A Gorruckpore coin I think.

„ 12th. I doubt this being a coin, but it was found on the site of Rajah Adisur's palace.

Eight Copper Coins found at Pandooa or Parwa.

A copy of the Magnetical and Meteorological Observations made at the Bombay Observatory, was presented by Lieut. O. F. P. Ferguson, Superintendent of the Observatory.

Lieut. W. Lees, duly proposed and seconded at the last meeting, was balloted for, and elected an ordinary member.

The Council submitted the following reply from the Under-Secretary to the Government of Bengal to the Society's application to be exempt from paying ground-rent for their premises :—

*From the Under-Secretary to the Government of Bengal,*

*To DR. A. SPRENGER,*

*Secretary to the Asiatic Society.*

*Dated, Fort William, 11th March, 1852.*

SIR,—With reference to your letter of the 2nd ultimo, I am directed by the Most Noble the Governor of Bengal to state that His Lordship has been pleased to exempt the Society from the payment of the ground-rent of their premises, so long as it is occupied by them. The Board of Revenue have been informed accordingly.

I have the honor to be,

Sir,

Your most obedient Servant,

(Signed) W. SETON KARR,

*Under-Secretary to the Government of Bengal.*

The President stated that at a meeting of the Council held on the 3rd instant, it has been resolved that Mr. Arthur Grote having, at the solicitation of Dr. Sprenger, kindly intimated his willingness to



undertake the duties of Joint-Secretary, the Council do recommend the appointment of Mr. Grote as Joint-Secretary to the next meeting; and then proposed that the recommendation of the Council be adopted. Mr. Colvin having seconded the motion, it was carried unanimously.

Mr. B. H. Hodgson of Darjeling communicated, through the President, two valuable papers on Trans-Himalayan Philology; one entitled, "Comparison and Analysis of Caucasian and Mongolian Vocables," and the other, "Sifan and Horsok Vocabularies, with another special exposition of the wide range of Mongolian affinities, and remarks on the lingual and physical characteristics of the family;" (with a sketch portrait). Ordered for publication in the Journal.

Mr. A. R. Young, Under-Secretary to the Government of India, by order of the Most Noble the Governor-General, submitted for the inspection of the Society thirty-two ancient gold coins found at Benares, together with a descriptive list of the same by Major Kittoe.

After a desultory conversation regarding these coins, it was resolved that drawings of such of them as are unknown be made for publication in the Journal.

Read a letter from Capt. Layard, enclosing fac-similes of Arabic inscriptions on the ruined mosque of Gour. Referred to the Council for examination and report.

Read letters from Professors Fleischer of Leipzig and Wiedmann of Munich, acknowledging the receipt of books sent to the German Asiatic Society and the Royal Academy of Bavaria respectively, and announcing despatch of certain publications.

Read a letter from Mr. Tottie, the Swedish Norwegian Consul in London, announcing despatch of a box of books from the Royal University of Christiania.

Mr. Houstoun having drawn attention to a communication from him to the Chairman of the preceding meeting respecting the publication of the *Hayat ul Haywan* in the *Bibliotheca Indica*, the Chairman stated in behalf of the Council, that the Society having sanctioned the publication of this work, the Council has not the power if it had the inclination, to interfere; and that Mr. H. was in error, in supposing that three Arabic works are in the course of publication.

The Curators and the Librarian having submitted their usual monthly reports, the meeting adjourned.



*Report of Curator, Zoological Department.*

SIR,—My Report for to-day records the donations received during the last four months, which are as follow:—

1. From A. Campbell, Esq. Darjiling. Skin, in winter *pelage*, with fine horns and hoofs complete, of the great Asiatic Stag, which I feel satisfied is the *CERVUS WALLICHII*, Duvaucel. This noble animal is the Tibetan *C. affinis* of Mr. Hodgson, and there is scarcely a doubt of its identity with the Stag of Kashmir (*C. cashmirensis*, Falconer, *MS.*, apud Gray), and little that it will prove to be the same as that of northern China, and as the *Irbisch* or great Stag of Siberia mentioned by Strahlenberg and Pennant.\* It may possibly also be the Persian *Maral*; though our impression is that the latter is more nearly affined to *C. ELAPHUS*, as the present species is to *C. CANADENSIS* (v. *strongyloceros*, *occidentalis*, &c.)† It, however, is a distinct species from *C. CANADENSIS*; and most decidedly it is that well figured in Mons. F. Cuvier's work by the name *C. WALLICHII*, approximated by me to *C. CANADENSIS* in *J. A. S. X*, 745. In Mr. Vigne's portfolio of drawings made in Kashmir and Little Tibet, was a careful figure of this animal in its summer *pelage*, taken from a captive individual in Kashmir; and this was bright rufous, like the

\* "Stags are totally extirpated in Russia, but abound in the mountainous southern tract of Siberia, where they grow to a size far superior to what is known in Europe. The height of a grown hind is four feet nine inches and a half, its length eight feet, and that of its head one foot eight inches and a half." Pennant's 'Arctic Zoology,' p. 31. Strahlenberg distinguishes the *Irbisch*, or great Stag, from the *Isubrissen*, or common Stag, of Siberia. Like *EQUUS HEMIONUS*, *OVIS AMMON*, and other species, it doubtless ranges from Southern Siberia to Tibet, &c.

† Since the above was in print, we have seen Mr. Gray's paper on the *CERVIDÆ*, read before the Zoological Society and re-published from its 'Proceedings' in *Ann. Mag. N. H.*, 2d series, IX, 413, (May, 1852). We see nought in it to modify our opinion regarding *CERVUS WALLICHII*. Mr. Gray may rest assured that there is no cis-Himalayan (or sâl-forest) stag of the Elaphine type (vide also Hodgson, in *J. A. S. XX*, 392): and when he refers to *C. WALLICHII* as "the Stag of India," he uses the term *India* in a most vague and latitudinarian sense, which cannot be conceded; it is little better when he refers even to *C. FRONTATIS* as an *Indian* animal. Mr. Gray pronounces the Persian *Maral* to be identical with *C. WALLICHII*. We only saw a living mature hind, and a young stag of the third (?) year,—an antler of which is figured in *J. A. S. X*, 750, pl. fig. 10. In size and colour the *Maral* would certainly seem to accord sufficiently with *C. WALLICHII*; and Mr. Gray is probably right in identifying them, however remarkable the range of climate, which indeed is considerable also, with *C. CANADENSIS* and even *C. ELAPHUS*.



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corresponding garb of the Wapiti, and of many other species of Deer (*e. g.* *C. DUVAUCELEI* of India): but the winter dress of the great Asiatic Stag is strikingly different from that of the Wapiti or great Stag of N. America—which has the upper parts very much paler, contrasting with darker limbs and belly. I cannot trace, also, the least appearance of the throat-beard conspicuous in an old male Wapiti; the tines of the antlers, I think, are shorter than is usual in that species; and there seems no tendency to the formation, in any specimen yet observed, of a small additional snag near the inner base of the first basal tine (or ‘brow-antler’), which in large Wapiti horns is of frequent occurrence (*Vide* X, 750, pl., figs. 3, 5, 6). The horn figured in Vol. XX, p. 393, pl. VIII, I consider to be that of a young *C. WALLICHII*: the peculiarity represented being very common in the horns of *C. ELAPHUS* of corresponding age. The second basal tine (or ‘bez-antler’) is far more constant in *C. CANADENSIS* and *C. WALLICHII* than in *C. ELAPHUS*, which last very commonly wants it (especially when young), as *constantly* in *C. BARBARUS*; the horn of which latter species, again, is precisely that of *C. DAMA* (or the Fallow Deer), but with a true elaphine bifid or trifid crown instead of the palmation.\* The whole of these, with the less affined (but mutually allied) *TARANDUS* and (extinct) *MEGACEROS*, constitute a series of forms wholly distinct from all other Deer, whether of America, S. E. Asia, or the Roes of Europe and N. Asia, which last have most affinity for American types. The possession of the median tine (or ‘royal antler’) is a characteristic distinction of this entire great Elaphine series as here indicated (with rare individual exceptions), being met with in no other Deer; and these animals are also conspicuously longer-bodied than other Deer, and have a different and distinct carriage. My impression is,—having seen several fine living examples of *C. CANADENSIS*, having studied them attentively at all seasons, and

\* In what does *C. BARBARUS* differ from the Corsican Stag figured by Buffon, and from the Stag of Greece (original *Ελαφος*), which I am informed is similar and distinct from *C. ELAPHUS* of modern zoologists? I have several careful figures of the Barbary Stag, male and female, drawn from first-rate specimens in the Zoological Society's Garden. The species is further remarkable for the comparative shortness of the limbs, and the enormously tumid larynx of the male during the rutting season. The stag of the Appenines is true *C. ELAPHUS*.



superintended the execution of sundry drawings that were taken of them with extreme care and the minutest attention to detail, whereby I happen to be particularly familiar with the character of the species,—that this great American Stag will be found to average a larger size than the Asian *C. WALLICHII*, if not to be constantly larger. They are, however, most closely affined, even more so than *Ovis ammon* and *O. MONTANA*.

2. From Mr. A. Hancock, of Newcastle-upon-Tyne, I have received a collection of sundries, of which I make over to the museum skins of *MELES TAXUS*, *NOCTULINIA NOCTULA* (2.), *TINNUNCULUS ÆSALON* (2.), *EUDROMIA MORINELLUS* (young), *TOTANUS GLOTTIS* (2., British specimens *perfectly identical* with the Indian *glottoides* of Vigors), *LARUS MARINUS* (adult), *OIDEMIA FUSCA* (male), and *PODICEPS CORNUTUS* (crested). Also a series of antlers (not fine) of *CERVUS ELAPHUS*, and two fine frontlets of *C. CAPREOLUS*; with examples in spirit of British Vipers, Frogs, and a few Insects. I further present the Society with the following specimens from Darjiling.—Skins respectively of *LASIURUS PEARSONII*, Horsfield (*J. A. S. XX*, 524),\* *TALPA MICROURA*, *HYSTRIX HODGSONII*, *AQUILA IMPERIALIS* (in uniformly brown plumage), *TCHITREA PARADISI* (fine parti-coloured male, killed in L. Bengal), *SITTA CASTANEOVENTRIS*, and the young of *ATHENE BRAMA*, *PSILORHINUS FLAVIROSTRIS*, *CORACIAS INDICA*, and *PARUS CINEREUS*. Also the carcass of an adult male *ARCTONYX COLLARIS*, both skin and skeleton of which have been prepared,—and a female *MELANOCORYPHA TORQUATA*, nobis, *J. A. S. XIII*, 962, *XVI*, 476.

3. From the Rev. F. Fitzgerald, a collection of mammalia, birds, reptiles, &c., from N. Carolina.

Of Mammalia are sent *FELIS RUFA*, Guld.; a skull; *MUSTELA FUSCA*, Bachman, 2 skins; *PROCYON LOTOR*, (L.), skull; *SCALOPS AQUATICUS*, (L.), in spirit; *SCIUROPTERA VOLUCELLA*, (L.), skeleton; *SCIURUS LEUCOTIS*, Gappar (v. *cinereus*, Harlan, et *carolinensis*, Godman), skin; and *MUS MUSCULUS*, L., two skins.

Of Birds, skins of *TINNUNCULUS SPARVERIUS*, fœm.; *BUTEO BOREALIS*, juv.; *BUBO VIRGINIANUS*, mas; *CERYLE ALCYON*, mas; *DRYOCOPUS PILEATUS*, fœm., and skull of male; *PICUS PUBESCENS*, mas; *COCCYZUS ERYTHROPHALMOS*; *CYANURUS CYANEUS*; *QUIS-*

\* *Noctulinia lasiura*, Hodgson, *J. A. S. XVI*, 896.





CALUS PURPUREUS (2); AGLAIUS PHOENICEUS (2); STURNELLA LUDOVICIANA; SPIZELLA PUSILLA; PASSERCULUS SAVANUS (2); CHRYSOMITRIS TRISTIS; CARDINALIS VIRGINIANUS (2); AMPELIS CAROLINENSIS; PROGNE PURPUREA, f.; TYRANNUS CRINITUS; SIALIA WILSONII; MERULA MIGRATORIA; MIMUS RUFUS; TRICHAS MARILANDICA; BUTORIDES VIRESCENS, juv.; CLANGULA GLAUCION, f.; MERGUS SERRATOR, f.;—with skull of NUMENIUS LONGIROSTRIS, and foot of HALIAËTUS LEUCOCEPHALUS.

Of Reptiles, EMYS GUTTATA (shell); STERNOTHERES ODORATUS (3 young, in spirit); CHELYDRA SERPENTINA (shell);—and all the following in spirit—PLESTIODON LATICEPS, PL. FASCIATUS (2); ANOLIUS PRINCIPALIS (2); COLUBER CONSTRICTOR; C. (?)—?; TROPIDONOTUS SIPEDON, (L.) Dekay (*Tr. fasciatus*, Schlegel, adult and young); TR. TÆNIA, Schœpff. (*Col. sertalis*?, L., three specimens); TR. SAURITA, (L.), Schlegel (young; and also young of two other species); HERPETODRYAS GETULUS (L.); H. ÆSTIVUS, (L.), Schlegel (2); H. —? (2); HETERODON COCCINEUS (*Rhinostoma coccinea*, Holbrook); TRIGONOCEPHALUS CONTORTRIX, (L. 2); CROTALUS DURISSUS; RANA PIPIENS (?), large tadpole; POLYPEDATES (*Hyla viridis* of Holbrook); P. —?; TRITON MULTIPUNCTATA; TR. NIGER (?); another affined to TR. SALMONEA; and large and small individuals of AMPHIUMA MEANS, Harlan.\*

CRUSTACEA. HOMARUS AMERICANUS and ASTACUS BARTONI in spirit. Also a few insects and a SCOLOPENDRA in spirit.

4. From Dr. Kelaart, of the Ceylon Medical Service, several packages have been received, which have greatly enriched our collections.

Of mammalia, we are indebted to him for skins, skulls, &c. of PRESBYTIS PRIAMUS, and skins of PR. URSINUS (*J. A. S. XX*, 155), young, and skin of PR. CEPHALOPTERUS, almost white (*Pr. albinus*, Kelaart, *J. A. S. XX*, 182); LEMUR CATTAL, L.; and numerous specimens of Bats, as follow:—

\* Certain of the snakes in this collection would appear to be undescribed, for we have been unable to make them out from M. Schlegel's work, and they are neither noticed in Dr. Harlan's "catalogue of North American Reptilæ," published in the "Journal of the Philadelphia Academy," Vol. V., nor among the "extralimits" enumerated in Dekay's "Natural History of New York."





*PTEROPUS EDULIS*, v. *Edwardsii*, &c.

*PT. LESCHENAUETHI*, DESM., v. *Pt. seminudus*, Kelaart. A fine pair in spirit, a skin, and specimen now prepared as a skeleton.

*CYNOPTERUS MARGINATUS*, (B. Ham.) Some ordinary brown examples in spirit, and a skin with the neck and sides of a very deep ferruginous hue, in which phase this species is the *C. Horsfieldii* of Mr. Gray. In old Bengal specimens, the same parts become deeply tinged with bright tawney or rufo-fulvous, but are never dark ferruginous, so far as we have seen.\* Malayan examples are of a paler and more uniform brown, and constitute the *C. titthæcheilus*, (Tem.), &c. &c.;† exhibiting no further difference whatever that we can perceive, notwithstanding the remarks of Dr. Horsfield in his recently published catalogue of the specimens of mammalia in the Hon'ble Company's Museum in London.

*NYCTICEJUS TEMMINCKII*, (Horsfield, nec Rüppell, *Atlas*), v. *Belangeri*, *castanea*, et *noctulinia*, auct. Two specimens, one paler than the other on the upper parts. By exposure to the light, the fur of this species fades and becomes much more rufous or rufo-fulvous; and in all Indian specimens that we have seen, the under-parts are constantly much paler than the upper: but in one Javanese example in the Society's collection, the upper-parts are of a much more vivid tawny-rufous or ferruginous colour than we have seen in any Indian specimen, and the under-parts are scarcely fainter in hue. We consider this to be a casual variety only, analogous to those of certain Horse-shoe and various other Bats mentioned in the sequel.‡ *N. B.* Although in the recent state, this very common Indian species is most easy to distinguish from *N. LUTEUS*, nobis (*J. A. S.* XX, 157), from the considerable difference of colour, however either may vary, they both fade and alter so much in colour by exposure to light that they then appear like larger and smaller races of the same species,—the under-parts of *M. LUTEUS*, however, becoming generally of a more

\* Since writing the above, we have obtained a fresh Calcutta specimen, which at first was very nearly as deeply tinged with ferruginous as the example from Ceylon; but, in drying, the colour has faded very considerably.

† Vide *J. A. S.* XV, 187.

‡ A similar Javanese specimen is noted in Mr. Gray's Catalogue of the specimens of mammalia in the British Museum.



rufescent hue than those of ordinary *N. TEMMINCKII*. The length of fore-arm in *N. TEMMINCKII* is very regularly 2 in., in *N. LUTEUS*  $2\frac{3}{8}$  in., and in *N. HEATHII*  $2\frac{3}{4}$  in. Examples of *N. HEATHII* from Ceylon appear to be constantly a good deal darker than those from S. India, unless perhaps from the more proximate districts of the continent.

*SCOTOPHILUS COROMANDELIANUS*, (F. Cuv.)

*VESPERTILIO ADVERSUS* (?), Horsf. Rather darker than a Calcutta specimen referred to the same, which latter entirely resembles an example procured at Penang.

*KERIVOULA PICTA*, (Pallas).

*MEGADERMA SPASMA*, Geoffroy. A skin and entire specimen in spirit. Identical in species with examples from Malacca and Java.

*RHINOLOPHUS AFFINIS* (?), Horsfield: *Rh. rubidus* et *fulvidus*, Kelaart, as also another supposed species referred to by the same gentleman in *J. A. S.* XX, 182-3; perhaps, too, the doubtfully cited *Rh. pusillus* from Ceylon of Mr. Waterhouse's catalogue of the mammalia in the Zoological Society's museum: but, it would seem, not *RH. AFFINIS* of Dr. Cantor's Catalogue of the mammalia inhabiting the Malayan peninsula (*J. A. S.* XV, 181). An extensive series of specimens, both in spirit and skins; and varying in hue from the most vivid rufo-ferruginous in both sexes, to dusky-brown paler below and without a shade of ferruginous or fulvous in either sex,—others again being intermediate,—and one adolescent example is dingy cinereous above, with here and there a slight admixture of rufous, and below chiefly of the latter hue. In structure there is no diversity whatever, and those of various colours were taken in company. The admeasurements of a full grown male are as follow. Length of head and body  $2\frac{1}{4}$  in.; of tail (additional) 1 in.; alar expanse  $10\frac{1}{2}$  in.; fore-arm  $1\frac{7}{8}$  in.; tibia  $\frac{7}{8}$  in.; ear-conch (posteriorly) barely  $\frac{3}{8}$  in. Facial appendages typical. Fur of mean length, somewhat dense, porrect, sinuous. A minute pair of upper incisors, liable to be overlooked, in the fresh specimen.

*HIPPOSIDEROS NOBILIS* (?), Horsfield: *Rhinolophus armiger*, Hodgson; *H. lankadiva*, Kelaart, vide *J. A. S.* XX, 183. Male and female in spirit; another specimen now set up as a skeleton; and a skin. Decidedly identical in species with Mr. Hodgson's *armiger*, and so far as can be judged from the figures and descriptions, also with the Malayan *H. NOBILIS*.



*H. SPEORIS*, (Schneider). Vide *J. A. S.* XIII, 489. Numerous specimens in spirit and also skins. It is remarkable that some examples of this species, also, are very bright rufo-ferruginous or golden-fulvous, others fulvous-brown more or less dark, and others again brown or slaty without a tinge of fulvous,—the ordinary colour (that heretofore described) however predominating, and, in general, it would seem that the brown Ceylon specimens run darker than those of *S. India*. Moreover, it would seem that the vivid rufous examples both of this and other species are comparatively rare, though from being particularly selected out of multitudes they may accumulate in collections.

*H. MURINUS*, (Elliot): of which there now can be no further doubt that *Rhinolophus fulgens*, Elliot, v. *H. fulvus*, Gray, is merely the corresponding vivid rufous phase to those noticed of *H. SPEORIS* and of the *RHINOLOPHUS*. Four specimens, all of a blackish tint, thus illustrating the *H. ater* of Dr. Templeton, and indicating that in the present species (as in the preceding) Ceylon examples run darker than those of *S. India*.\*

\* The observation of these varieties of colour in different Horse-shoe as well as in other genera of Bats shews that colour has been too much regarded in the attempt to discriminate the species of these animals. It is a variation that has long been known in some of the *RHINOLOPHUS*, and M. Geoffroy St. Hilaire was of opinion that the rufous hue becomes more intense in proportion as these animals inhabit nearer the equator. Indeed, this would seem generally to be the case, though the Australian *RH. AURANTIACUS* of Mr. Gray is stated to rival in the vivid intensity of its colouring the 'Cocks of the rock' (*RUPICOLA*). Numerous examples of the variation in question may here be conveniently adduced.

*RHINOLOPHUS LUCTUS*, Tem. (Apparently identical with *Rh. perniger*, Hodgson, inhabiting the S. E. Himalaya and the Khásya hills.) Rufous variety, from Manilla, described by MM. Eydoux and Gervais in the Zoology of the voyage of 'la Favorite.' Perhaps also Mr. Gray's *Rh. morio* from Singapore, the fur described as "reddish brown;" yet in Mr. Gray's catalogue of the specimens of mammalia in the British Museum, he terms this "the Black Horse-shoe Bat," a name suitable enough for ordinary *RH. LUCTUS*.

*RH. MINOR* (?), Horsfield. The *Rh. lepidus*, nobis, from Bengal, Masuri, &c., would appear to exemplify the ordinary phase of what we now take to be this species, and *Rh. subbadius*, Hodgson, to represent the rufous phase. At least *Rh. lepidus* and *Rh. subbadius* prove to differ only in colour, and both seem to be referable to *RH. MINOR*. (Since writing the above, we have observed that Mr. Hodg-



Of *Carnivora*, three species of Mungouste are sent, viz. *MUNGOS VITTICOLLIS*, (Bennet), injured ;—*HERPESTES RUBIGINOSUS*, Kelaart, v. *Ellioti*, nobis, vide *J. A. S.* XX, 162, 184 ;—and *H. FULVESCENS* et *flavidens*, Kelaart, *loc. cit.* Of the two latter, *H. RUBIGINOSUS* is affined to *H. NYULA*, Hodgson, in size and the character of its fur, but the rufous ground-tint predominates, the tail-tip is black and the four paws are blackish ; and *H. FULVESCENS* is similarly affined to *H. GRISEUS*, but is of a much deeper colour, a deep fulvous or tawny predominating, and the coat is more dense, though by no means so full and so developed upon the tail as in *H. FUSCUS*, Waterhouse, of the Nilgiris. The name *flavidens* is objectionable as being quite unfounded,

son assigns his *SUBBADIUS* to *HIPPOSIDEROS* in *J. A. S.* XV4, 896 ; but the specimens which he sent to the Society by that specific name are genuine *RHINOLOPHUS*.)

*RH. MACROTIS*, Hodgson. Of this sub-Himalayan species we have both brown and light rufous examples.

*RH. AURANTIACUS*, Gray. The description of this Australian species is not at hand ; but we may suggest that it probably is merely a rufous variety of *RH. MEGAPHYLLUS*.

*HIPPOSIDEROS DIADEMA*, (Geoff.) Vide Cantor, in *J. A. S.* XV, 182.

*H. LARVATUS*, (Horsfield), the rufous phase,—and *Rhinolophus vulgaris*, Horsf., the dark phase. The Arakan species described under these names in *J. A. S.* XIII, 488, appears on present evidence to be correctly assigned.

*Taphozous fulvidus*, nobis, *J. A. S.* X, 975, is merely a fulvescent phase of *T. LONGIMANUS*. (*T. brevicaudus*, nobis, also, was founded on a specimen of *T. LONGIMANUS* distorted by the stuffer ; and as *T. crassus*, nobis, proves to be identical with *T. SACCOLAIMUS*, Tem., v. *pulcher*, Elliot, and as we further are not now satisfied of the distinctness of *T. Cantori*, nobis, from *T. LONGIMANUS*, the Indian *TAPHZOI* would accordingly be reduced to *T. SACCOLAIMUS*, Tem., *T. MELANOPOGON*, Tem., and *T. LONGIMANUS*, (Hardwicke),—all three inhabiting the peninsula of India as well as the countries to the E. and S. E.

*NYCTICEJUS TEMMINCKII*, (Horsf.), exhibits occasionally an uniform bright tawney-rufous phase of colouring (in the Malay countries only, so far as observed), which has already been remarked in the text.

*NYCTICEJUS* (small undetermined species, common about Calcutta). The writer once shot a specimen, now in the Society's museum, with patches of bright golden-fulvous on the lower-parts.

*CYNOPTERUS MARGINATUS*, (B. Ham). Vide text.

Analogous variations occur in sundry birds, which exhibit an occasional rufous or tawney phase of colouring ; e. g. various *CUCULI*,—certain Owls (especially the small Indian *Scops*, of which the grey phase was named *Sc. pennata* and the



and we therefore substitute for it the other appellation by which it has also been described.\*

**LUTRA NAIR**, F. Cuv. Specimen procured at an elevation of 4,500 ft., near Newera Elia.

**URSUS LABIATUS**. Skull of an old female.

**SOREX**. Two species of typical Shrew, one the *S. FERRUGINEUS*,

rufous phase *Sc. sunia* by Mr. Hodgson),—some of the Asiatic *PODARGI* (v. *Batrachostomi*), vide *J. A. S.* XVIII, 806, &c.

\* The determination of the above species of Mungouste necessitated a more elaborate study of the various Indian species of the group than we had previously the opportunity of bestowing; and the following are the results arrived at, from the series of specimens now in the Society's museum, among which we discriminate the following:—

1. *URVA CANCRIVORA*, Hodgson. Hab. Nepal; Arakan; Afghanistan (Griffith).
2. *MUNGOS VITICOLLIS*, (Bennet). Hab. Malabar; Ceylon. (*N. B.* Barely separable, generically, from the last, although the bony orbital rings are complete in adults—as in the following species, with the exception of *H. BRACHYURUS* which is about equally worthy of separation. The black lateral neck-band in the present species is represented by a white one in the preceding).
3. *HERPESTES RUBIGINOSUS*, Kelaart; *H. Elliotti*, nobis. Hab. S. India; Ceylon.
4. *M. MALACCENSIS* (?), Fischer: *H. nyula*, Hodgson: *H. griseus* apud nos, passim. Hab. Bengal; Nepal; Arakan? Malayan peninsula? We possess a fine mounted albino of this species, referred to *H. GRISEUS* in *J. A. S.* XV, 250.
5. *H. GRISEUS*, (Geoffroy). *Viverra mungo*, L., et *H. pallidus*, Schinz, apud Horsfield. Hab. Hindustan; S. India; Ceylon? *N. B.* Resembles the last in size and form, and *H. NIPALENSIS* in the character of its fur.
6. *H. FULVESCENS*, v. *flavidens*, Kelaart. Hab. Ceylon; S. India?
7. *H. NIPALENSIS* et *auropunctatus*, Hodgson. Hab. Bengal; Upper India generally; Sindh; Afghanistan; Malayan peninsula (Cantor). *N. B.* Varies much in general cast of colour, ashy or fulvous prevailing, some also being very pale, others dark.
8. *H. JAVANICUS*, (Geoff.) Hab. Malayan peninsula and archipelago, ascending northward to Chittagong. *N. B.* Does not seem to differ from the last except in colour.
9. *H. FUSCUS*, Waterhouse. Hab. Nilgiris.
10. *H. (?) BRACHYURUS*, Gray. Hab. Malayan peninsula. *Remark.* The only two species of Mungouste inhabiting Bengal are *H. MALACCENSIS* ? (*nyula*) and *H. NIPALENSIS*.



Of *Carnivora*, three species of Mungouste are sent, viz. *MUNGOS VITTICOLLIS*, (Bennet), injured ;—*HERPESTES RUBIGINOSUS*, Kelaart, v. *Ellioti*, nobis, vide *J. A. S.* XX, 162, 184 ;—and *H. FULVESCENS* et *flavidens*, Kelaart, *loc. cit.* Of the two latter, *H. RUBIGINOSUS* is affined to *H. NYULA*, Hodgson, in size and the character of its fur, but the rufous ground-tint predominates, the tail-tip is black and the four paws are blackish ; and *H. FULVESCENS* is similarly affined to *H. GRISEUS*, but is of a much deeper colour, a deep fulvous or tawny predominating, and the coat is more dense, though by no means so full and so developed upon the tail as in *H. FUSCUS*, Waterhouse, of the Nilgiris. The name *flavidens* is objectionable as being quite unfounded,

son assigns his *SUBBADIUS* to *HIPPOSIDEROS* in *J. A. S.* XVI, 896 ; but the specimens which he sent to the Society by that specific name are genuine *RHINOLOPHI.*)

*RH. MACROTIS*, Hodgson. Of this sub-Himalayan species we have both brown and light rufous examples.

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Kelaart, *J. A. S.* XX, 185,\* (perhaps *S. niger*, Elliot, of Horsfield's Catalogue?): the other sent as the "large godown Shrew of Kandy," and according pretty well with Schinz's description of *S. SERPENTARIUS*, Belanger. Length of head and body about  $4\frac{3}{4}$  in.; tail  $2\frac{1}{8}$  in.; tarse to end of claws  $1\frac{3}{8}$  in.; skull  $1\frac{3}{8}$  in. Colour dusky slate, with rufescent tips to the fur of the upper-parts; beneath the fur is shorter and more appressed, and somewhat paler, with a faint tinge of rufous about the breast. Not improbably undescribed, and quite distinct from the two other Ceylon Shrews described *J. A. S.* XX, 163.

**SCIURUS.** Of this genus, Dr. Kelaart has only sent a fragment of the skin of a young *SC. MACROURUS*, Forster (var. of a ruddy-white or whitish-isabelline colour); and, on loan, a skin of the rufous-capped Striped Squirrel, *SC. KELAARTI*, Layard (vide note to *J. A. S.* XX, 166), remarkable for having its three pale dorsal stripes unusually clear whitish, the five dark stripes unusually blackish and strongly contrasting, the medial whitish stripe narrow and the lateral broad, and the crown but faintly tinged with fulvous. Neither this nor *SC. BRODIEI* are very satisfactorily distinguished from *SC. TRISTRIATUS*, of which they seem to be local varieties merely; all retaining the deep rufous tinge under the tail by which they may be at once distinguished from *SC. PALMARUM*, and it remains to ascertain whether the *voice* severally differs, as is so remarkably exemplified by *SC. PALMARUM* and *SC. TRISTRIATUS*.†

The **MURIDÆ** sent are—*GERBILLUS INDICUS*, skin and examples in spirit,—*MUS INDICUS*, Geoffroy, in spirit,—*M. FLAVESCENS*, Gray,

\* Of two specimens of this Shrew sent formerly by Dr. Kelaart, one was labelled *S. MONTANUS* by mistake, and we thus came to describe both by the name *MONTANUS* in *J. A. S.* XX, 163, dropping the name *FERRUGINEUS* by which Dr. Kelaart has since described the same species in XX, 185. He now writes word that he agrees in considering the two specimens referred to as being of one species, his *S. FERRUGINEUS*; whilst his *S. MONTANUS* has never been sent here at all, his only specimen having been forwarded to Dr. Andrew Smith in England.

† In a communication just received from Mr. Layard, it seems that he also is now of opinion that *SC. BRODIEI* and *SC. KELAARTI* may be varieties of *SC. TRISTRIATUS*; but in *Ann. Mag. N. H.*, 1852, p. 335, he states of *SC. BRODIEI* that its voice is far more shrill than that of *SC. TRISTRIATUS*; and also of *SC. LAYARDI*, nobis, that—"I shot it in dense jungle, being attracted to it by the *voice*:" but the last is undoubtedly a strongly marked distinct species.



and its var. *kandianus*, Kelaart, *J. A. S.* XX, 169, several specimens in spirit, confirming the opinion expressed *loc. cit.* of the non-distinctness of this as a species from *M. FLAVESCENS*,—*M. NEMORALIS* (?), nobis; adolescent? (this is sent as “the common house Rat of Trincomali and Batticoloo; I never,” adds Dr. Kelaart, “saw it elsewhere”): *M. MUSCULUS*, L., from Kandy, skin, and specimen in spirit (the first instance we have seen of the common European house Mouse from any part of Asia, though of course it must be continually brought by the shipping),—and, lastly,—

*MUS FULVIDIVENTRIS*, nobis, *n. s.* A field Mouse from Trincomali, affined to *M. TERRICOLOR*, nobis, *J. A. S.* XX, 172, and to another we have since discovered in the neighbourhood of Calcutta.\* Length probably about  $2\frac{3}{4}$  in.; tail (vertebræ)  $2\frac{1}{2}$  in.; tarse to tip of claws  $\frac{5}{8}$  in. Colour of *M. SYLVATICUS* above, the fur shorter and less fine, and straight (as in its various Indian affines); lower-parts rufescent or isabelline, or they may be described as pale weak ferruginous. Twenty caudal vertebræ distinguishable with  $\frac{1}{4}$  in. additional of tail-tip.

*HYSTRIX HIRSUTIROSTRIS*, Brandt: *H. leucurus*, Sykes; *H. zeylonensis*, nobis (the young). Skins and skulls.

*SUS*——? Three skulls of wild Boars of different ages from Trincomali do not present the peculiarities of form of the skull sent by Mr. Layard, upon which is founded the *SUS ZEYLONENSIS*, nobis, *J. A. S.* XX, 173; but are nearly affined to the continental race with narrow occiput, this part, however, being rather less narrow than in the Indian specimen described *loc. cit.*

*MANIS PENTADACTYLA*, L.: *M. brachyura*, Erxl., &c. The skin of a full grown specimen, establishing this species as an inhabitant of the island.

Of Birds, the most remarkable is a new species of *CIRCAËTUS* or *HÆMATORNIS*, Vigors, forwarded also by Mr. Layard.

*H. SPILOGASTER*, nobis, *n. s.* Rather smaller than *H. CHEELA*, (Lath., v. *undulatus*, Vigors), and remarkable for having the under-parts as in the adult of that species, while the upper-parts, throat and

\* *M. ALBIDIVENTRIS*, nobis, *n. s.* Resembles *M. TERRICOLOR*, nobis, except in being much larger, and generally greyer or less fulvescent. Length of a large male (fresh)  $6\frac{1}{4}$  in., of which the tail is  $2\frac{3}{4}$  in.; tarse to tip of claws  $\frac{1}{10}$  in.; ear (from anterior base)  $\frac{9}{16}$  in.



tail, retain in the adult the same colouring as that of the young of *H. CHEELA*; a phase of plumage which we have never seen among the multitude of Bengal specimens of *H. CHEELA* examined, but which is exhibited in the two now received from different parts of Ceylon. A figure of a third specimen is given in a collection of zoological drawings from Ceylon forwarded on inspection by Mr. J. A. Moorgaart. In this the irides are represented *pure white* (as in *P. JORNIS TEESA*), whereas those of *H. CHEELA* are *brilliant golden-yellow*.

*SPIZAËTUS LIMNAËTUS*, (Horsf.), var. *CIRRHATUS* et *cristatellus*, auct., of peninsular India generally. Specimen rather small.

*BUCEROS PICA*, Scopoli. The common Pied Hornbill of Ceylon; sent also by Mr. Layard. Identical with Indian specimens: and we therefore consider *B. violaceus*, Shaw, apud Wagler (with four black medial tail-feathers) to be merely a casual or occasional variety, more especially as we have seen continental examples with the sub-medial rectrices partly black.

*B. GINGALENSIS*, Shaw. Head of male.

*CUCULUS SONNERATII*, Latham.

*MALACOCEREUS GRISEUS*, (Lath.), var. Resembling the species of S. India, excepting that the head is concolorous with the rest of the upper-parts.

*GRAUCULUS JAVENSIS* (? Horsfield). Sent also by Mr. Layard. Differs from *GR. MACEI* of continental India in its considerably smaller size, the wing measuring but  $5\frac{1}{2}$  in., with the rest in proportion.

*GALLUS STANLEYI*, Gray. A fine hen. We had previously only a pullet of this sex.

*DROMAS ARDEOLA*, Payk., in immature plumage. An extremely interesting specimen, as distinctly indicating the affinities of this (as hitherto considered) anomalous and isolated genus. The plumage is precisely that of a young Tern: and from all the details of outward structure, it will be seen that this curious form is but an extraordinary modification of the Tern type, just as *PHENICOPTERUS* is a most singular modification of the type of *ANSERINÆ*. But the Gulls and Terns, or *LARIDÆ*, are more nearly affined in their whole organization\*

\* Also by the number and colouring of the eggs, character of the chick, and by





to the great series of CHARADRIADÆ and SCOLOPACIDÆ, auct., than they are to the true PALMIPEDES; and indeed approximate the CHARADRIADÆ, &c., much more than the latter do to either the ARDEIDÆ or RALLIDÆ: and therefore they claim to rank rather among the GRALLATORES than among the NATATORES, though the genus DROMAS alone assumes the characteristic proportions of an ordinary wader. It will be remarked that the habits of DROMAS are entirely those of a sea-side Tern: and an egg formerly sent by Mr. Layard as most probably appertaining to this species (and it could not well have belonged to aught else) is further confirmatory of the view here taken of the position of this remarkable genus in the natural system.\*

PORZANA ZEYLANICA, (Gm.) Differs from a specimen from Gumsur in the deep rufous colour being more developed at the base of the nape, and also margining the scapularies, wing-coverts, and longest tail-coverts, where no trace of it is perceptible in the Gumsur specimen. The latter would seem to be of a distinct variety, if not closely affined species.

A few other specimens in this class require no special notice.

Of Reptiles, Dr. Kelaart has forwarded—

TESTUDINATA. EMYS SEBA, Gray (sent also by Mr. Layard).—and EMYDA PUNCTATA, Gray (v. *Cryptopus granosus*, Dumeril and Bibron).

SAURIA. CROCODYLUS PALUSTRIS, Lesson;—MONITOR DRACÆNA, (L.), Gray (v. *Varanus bengalensis*, D. and B.);†—HEMIDACTYLUS FRÆNATUS, Schl.; H. COCTÆI, D. and B. (common in Bengal, but not hitherto observed in S. India); H. LESCHENAULTII, D. and B.;—LYRIOCEPHALUS SCUTATUS, (L.), 5 adults; CALOTES OPHIOMACHUS, (Merrem); C. VERSICOLOR, (Daud.):—C. ROUXI (?), Dumeril and Bibron, and C. MYSTACEUS, Dumeril and Bibron, were sent formerly by Mr. Layard.

the seasonal changes of colouring of the genus HYDROCHELIDON in particular: by the voice likewise; and by their haunts and general habits.

\* In PODICA and HELIORNIS we recognise the converse modification, in a Rallidous genus presenting the proportions of an ordinary swimmer. N. B. It should be remarked that we perceive little affinity between the true LARIDÆ and the PROCELLARIIDÆ (or Albatrosses and Petrels).

† V. BIBRONI, nobis, J. A. S. XI, 869, we now consider to be a variety merely of this species, which appears to be the only *Varanus* of all peninsular India.





BATRACHIA. RANA CUTIPORA, D. and B.; R. MALABARICA, auct.; R. BENGALENSIS, Gray; ENGYSTOMA MARMORATUM; POLYPEDATES LEUCOMYSTAX, (Gray.); P. CRUCIGER, nobis, n. s.; BUFO MELANOSTICTUS, Schneider.

CALOTES OPHIOMACHUS. Specifically identical with an example from the Nicobars, noticed *J. A. S.* XV, 376 :\* but a nearly affined CALOTES from Cherra Punji (presented by Mr. Frith) differs in having the head much flatter, the nuchal spines less laterally compressed or widely flattened and more rigid, being scarcely at all expanded on their terminal half, and in having a well marked second sincipital crest above the ear, shewing eight spines, the first three of which are short and the fifth longest: there is also no black stripe through the eye.—C. PLATYCEPS, nobis, n. s.

C. VERSICOLOR. Specimens very strongly mottled, but apparently identical with the extremely common and only species of this genus we know of in Lower Bengal.

C. ROUXI? This species is probably distinct and undescribed: but as Dr. Kelaart has forwarded a series of Ceylon reptiles to Dr. Andrew Smith in England, we decline naming it at present. Crest of elevated flattened spines much longer than in C. VERSICOLOR, continued along the entire back and over the base of tail; two isolated spines, one before the other, above the ears; oblique plait of neck, before the shoulders, well marked in adults; a very slight *fanon*, or indication of one, on the throat; lateral scales fully twice as large as the abdominal; longest hind-toe reaching to the ear; tail  $\frac{2}{3}$  of the total length: colour fulvous-green, reddening on the throat of two specimens under examination; tail (in the faded specimens) chiefly albescent; radiating dark marks on the eyelids, as in C. VERSICOLOR.

C. MYSTACEUS.† Nuchal and dorsal crest diminishing gradually to base of tail; two separate groups of 3 or 4 spines each above each ear; lateral scales not much larger than the abdominal; a very distinct well marked *fanon* in adults; tail  $\frac{2}{3}$  of the total length; longest

\* The supposed CALOTES MYSTACEUS of the Nicobars, *loc. cit.*, is a SALEA of Mr. Gray, except that the back is crested throughout; and a very similar species in the museum, save that the throat-skin is lax and forms a sort of *fanon*, was procured, we believe at Mirzapore, by the late Major Wroughton.

† Identical in species with examples since received from Rangoon.



hind-toe reaching to the ear ; colour remarkable, green, with 4 or 5 large red blotches on each side ; the tip of upper lip, border of under lip, and nape, appear to have been blue in adults ; and the border of the lower lip yellow, continued as a broad stripe to the shoulder ; no radiating mark on the eye-lids.

*RANA BENGALENSIS*, Gray, *Hardw. Ill. Ind. Zool.* In *J. A. S.* XVI, 1016, Dr. Cantor supposes the figure cited to have been perhaps intended for *R. LESCHENAULTII*. It is, however, a common Calcutta species which we had not previously seen from elsewhere, being more affined to *R. MALABARICA*, from which it differs in its much smaller size (never, that we have seen, attaining the magnitude of adult *R. TEMPORARIA*), and much more slender toes which are fully webbed ; the colouring is nearly similar, but it appears never to have the pale dorsal stripe, and the dark markings of the back are generally obsolete ; there are never any distinct dark bands, also, upon the rami of the lower jaw, but the entire throat is *marbled* more or less distinctly. Another common Calcutta species of the same or smaller size (inhabiting also Arakan) is coloured exactly as in *R. MALABARICA* and varies similarly ; but this (*R. ASSIMILIS*, nobis,) has invariably the hind-feet much less webbed, and the long second toe is nearly free for its terminal three phalanges.

*POLYPEDATES CRUCIGER*, nobis, *n. s.* This fine Tree Frog much resembles *P. LEUCOMYSTAX* in form, but is double the size, with no spots on the body, nor marbling of the posterior surface of the thigh ; but a black line proceeds from each eye obliquely across to the loin on the opposite side, the two crossing each other over the occiput, and there is a small transverse line before and behind respectively, connecting the extremities of the two long diagonal lines ; a black lateral line also from the corner of the eye terminates in a large black spot in some specimens, while in others the whole of these markings are more or less obliterated. Length of head and body  $3\frac{1}{4}$  in. ; of hind-limb to extremity of toe 5 in.\*

In a collection of zoological drawings from Ceylon, obligingly forwarded for inspection by Mr. J. N. Moogaart (at the request of Dr.

\* We have a still finer Tree Frog from the Naga hills, Asám (*P. SMARAGDINUS*, nobis). Length of head and body  $3\frac{1}{4}$  in. ; hind-limb  $5\frac{1}{4}$  in. Wholly green above, changing in spirit to livid-blue ; under-parts pale.



Kelaart), we further recognise the common *EUPREPIS MULTIFASCIATUS*, (Wagler),—*RANA LESCHENAULTII*, D. and B.,—*ENGYSTOMA MALABARICUM*, Jerdon,—and a fine species of *MEGALOPHRYS*. *CALOTES OPHIOMACHUS* is coloured variously, and the fully adult at the height of the breeding season would appear to be of a deep blackish-green, with the usual transverse narrow white body-stripes, and the head and throat dark crimson.

**FISHES.** *LETHRINUS*——? Affined to *L. HARAK*, (Forster), and found also at the Sandheads;—*PLATAX OCELLATUS*, C. and V.; *SYNANCEIA BRACHIO*? (fine specimen);—*XYRICTHYS TENIURUS*, Val.; *CANNORHYNCHUS* (*Fistularia*, auct.,) *IMMACULATUS*, (Forster);—*ECHENEIS REMORA* (probably from the Atlantic).

*TETRODON ARGENTATUS*, nobis, *n. s.* Affined to *T. OBLONGUS*, Bloch. Colour livid brown above, with numerous specks and some larger scattered round spots of a deeper hue; dilatable abdominal skin of a livid or dead white; on the side a broad brilliant silvery stripe from mouth to tail, enclosing the pectoral, and a similar spot before the eye. Irides golden. Length  $5\frac{1}{2}$  in.; distance from snout to pectoral  $1\frac{1}{2}$  in.; do. to dorsal 3 in.

6. From E. L. Layard, Esq. A collection of sundries from Ceylon. Among them is the skin of a Squirrel, which we consider to be merely a pale variety of *SC. MACROURUS*, with worn and faded fur. Among the birds, we find a second example of *CARPOPHAGA PUSILLA*, nobis, *J. A. S. XVIII*, 816, described from a Nilgiri specimen: and the male and female of what will doubtless prove to be *TRERON POMPADORA*, (Gm.); differing only from *TR. MALABARICA*, Jerdon, in having a broad yellowish-green forehead, no trace of ruddy-orange on the breast of the male, and sullied white lower tail-coverts in both sexes (those of the male *TR. MALABARICA* being constantly of a deep ferruginous hue). The females are similar excepting in the colour of the forehead. Size rather inferior to that of *TR. MALABARICA*, the length of closed wing  $5\frac{1}{2}$  in. An *EDOLIUS* is also peculiar, and nearly resembles *E. PARADISEUS* of the Malay countries, but has the frontal crest more developed, though much less so than in the *EDOLI* we have seen from S. India. *BUCEROS PICA*, Scopoli, is also sent as the common Pied Hornbill of the island: and other species of birds worthy of remark are *PIPRISOMA* (*SMICRORNIS*?) *AGILE*,—new to the Ceylon





fauna,—and *DRYMOCATAPHUS FUSCACAPILLUS*, nobis, *J. A. S.* XVIII, 815, but which should rather have been classed in *PELLORNEUM*.\*

Mr. Layard has further favored us with a most valuable and interesting collection of shells, in all more than 200 species, and we have now to thank him for about 170 species, and fine series of many of them,—land, fresh-water, and marine,—while of others are sent inferior or imperfect examples, for report as to whether we required good specimens of the same, in which case Mr. Layard will forward them and has probably ere this done so. The species presented by him to the Society are from various parts of the world, but a large proportion of them, particularly of the land and fresh-water species, are from Ceylon.†

\* In the genus *PELLORNEUM* should likewise be merged *DUMETIA*, nobis, founded on the *Timalia hyperythra*, Franklin, of S. India and Ceylon, *Malacocercus? albogularis*, nobis, *J. A. S.* XVII, 453. There would thus be four ascertained species of *PELLORNIUM*, Sw., all closely affined to *MALACOCERCUS* in form and habits.

† The following species of fishes have also, on different occasions, been presented to the Society by Mr. Layard.

*UPENEUS RUSSELLII*, C. and V.;—*HOLOCENTRUM ORIENTALE*, C. and V.;—*PLATYCEPHALUS SCABER*, (Bloch);—*GLIPHISODON RAHTI*, C. and V.;—*CHÆTODON SEBANUS*, C. and V.;—*CH. LAYARDI*, nobis, *n. s.*;—*ACANTHURUS TRIOSTEGUS*, (Bloch);—*A. XANTHURUS*, nobis, *n. s.*;—*AMPHACANTHUS JAVUS*, (L.);—*A. SUTOR*, C. and V.;—*BARBUS TOR* (? B. Ham.), young;—*HEMIRHAMPHUS GEORGHII*, Val.;—and *RHOMBUS TRIOCELLATUS*, Cuv.

*CHÆTODON LAYARDI*, nobis, *n. s.* Affined to *CH. VAGABUNDUS*, L. General colour (in spirit) golden-brown, with a broad vertical blackish band from occiput to throat passing through the middle of the eyes, bordered behind by a white band of similar breadth, and this by a much narrower dark streak not reaching to the throat; lips and chin black, separated from the dark ocular band by a white space of the same breadth; fins whitish, with a single black band crossing the tail,—another extends throughout the soft portion of the anal, and having a strongly defined white border above, and a less defined whitish border below, and the posterior or descending portion of the dorsal has also a similar black band, continued a little over the base of the tail; longitudinal bands on the sides as in *CH. VAGABUNDUS*, &c. *D.*  $\frac{3}{2}$ ; *A.*  $\frac{3}{10}$ ; *C.* 17; *P.* 15; *V.*  $\frac{1}{2}$ . Length of specimen  $2\frac{1}{2}$  in.

*ACANTHURUS XANTHURUS*, nobis, *n. s.* Affined to *A. XANTHOPTERUS*, Cantor, but deeper in the body, and wholly black with bright golden-yellow tail, and a tinge of the same upon the pectorals. *D.*  $\frac{3}{4}$ ; *A.*  $\frac{3}{11}$ ; *C.* 17; *P.* 15; *V.*  $\frac{1}{2}$ . Length of specimen  $7\frac{1}{4}$  in.

Two species of Snakes have also been sent by Mr. Layard, viz. *TRIGONOCEPHALUS HYPNALIS*, (Merrem), and *XENODON PURPURASCENS*, var.





7. From Walter Elliot, Esq., Madras C. S., now at Masulipatam. Three specimens of *TUPAIA ELLIOTI*, Waterhouse; the Tupaie of the Coromandel coast. According to Mr. Waterhouse, this animal "is about equal in size to *T. TANA*;" but the examples here noticed do not exceed *T. FERRUGINEA* in size, and are obviously distinct as a species from either of those of the Malay countries.

8. From Babu Rajendra Mallika. The carcass of a small Indian Bear (skull only preserved). Also that of a kid of *TETRACEROS QUADRICORNIS*, and do. *MUNTJACUS VAGINALIS*.

9. From the Barrackpore menagerie. Carcasses of *PRESBYTIS MAURUS*, and of a very fine male Leopard,—both skin and skeleton preserved of the latter.

10. Dr. A. Bedford. Skin of *EURYNORHYNCHUS PYGMÆUS*, procured at the Sandheads.

11. Mrs. E. Woodley. A white Sparrow.

12. Mr. R. Smith. A species of *MANTIS*.

13. Capt. McFarlane, of the barque 'Arrow.' Two specimens of an *OCTOPUS*, "blown or washed on board during a typhoon in the China Sea." E. BLYTH.

*Report of Curator, Zoological Department.*

SIR,—My Report for the present meeting records the donations to the Zoological Department of the Society's Museum for the last three months, which are as follow :

1. From C. T. Lushington, Esq. The carcass of a young *GLOBICEPHALUS* (or 'Ca'ing Whale'), of the species noticed in *J. A. S.* XIX, 426, killed in the Hugly near Serampore. It has been prepared as a stuffed specimen; and of the adult we possess skeletons of both sexes, that of the female having been mounted or put together. Closely affined to the European *GL. DEDUCTOR*, this species differs externally in being wholly of a black colour. Its intermaxillaries are shorter; the teeth fewer and larger, numbering 6 or 7 above and 7 or 8 below on each side; the upper view of the maxillaries differs considerably in contour, being broader and less elongated in the Indian species; and there are other discrepancies which are less marked. *GL. INDICUS*, nobis, *n. s.*

2. From Capt. T. P. Sparkes, Ramri. The left radius, two lumbar and one sacral vertebræ, of an enormous Whale (*BALÆNOPTERA* ?); and two lumbar vertebræ and the second (?) right rib of a smaller Whale. These Capt. Sparkes supposed to have belonged to one individual, respecting which he contributes the following information. "The Whale was



thrown up dead and in a horrid state of decomposition on Juggoo or Amherst Island during last rains. I was unable to see it myself, but was told that the carcass measured 84 ft. in length. The vertebrae and rib were all that I could recover on visiting the island just before I came up to Calcutta, with the exception of the two jaw-bones, each about 14 ft. long, which the steamer was unable to bring up last trip, but which I will send you on her return this time from Arakan. This is the only instance I have heard of, of a Whale being stranded on the Coast of Arakan." Nevertheless, the bones sent are certainly those of two individuals and probably species, differing materially in size;\* and we have a note of a Whale of the largest size having been stranded on the Chittagong Coast, as recorded in the 'Friend of India' newspaper for September 15th, 1842, and copied into most of the contemporary Indian Journals; but no description was taken of it that would determine the genus.

3. From Mr. E. Lindstedt. A specimen, evidently an adult male, of *ACCIPITER NISOIDES*, nobis, *J. A. S.* XVI, 727, and shewing that the example previously described was the skin of a younger male and not of a female; also the skin of a presumed adult male *BATRACHOSTOMUS AURITUS*, (Vigors), differing from the supposed adult female in its rather smaller size and much darker and less rufescent colouring; an example of *BUTALIS LATIROSTRIS*, (Raffles), v. *poonensis*, Sykes, et *terricolor*, Hodgson; and the nest of a species of *DICAËUM*,—all from Malacca.

4. From Capt. Phayre, Commr. of Arakan. The skull and an imperfect skin of a Hare "from the east side of the range of mountains dividing Arakan from the valley of the Irawaddi, where the S. W. monsoon is much modified." It would appear to be identical with *LEPUS SINENSIS*, Gray, of Hardwicke's 'Illustrations of Indian Zoology,' known only by that figure. The skull closely resembles that of *LEPUS RUFICAUDATUS*, Is. Geoff. (the common Bengal Hare); and so far as can be judged from what remains of the skin (the ears having been destroyed), the general structure would appear to be quite similar: but the colouring is remarkably different; being a mixture of deep tawny or rufo-fulvous with much black on the upper-parts, and the under-parts whitish. The paws are black underneath, mingled with some tawny along the lower surface of the tarsus; the latter being almost pure white externally, and thus forming a remarkable and striking contrast with the hue of the lower surface. Tail black above and at the tip, whitish below towards its base. On the sides towards the belly

\* Indeed the sacral vertebra above noticed very probably pertained to a third individual, judging from the fact that it presents the appearance of having been much longer exposed to the effects of atmospheric and other destructive influences.



the fur much resembles both in colour and texture that of the entire upper parts of *L. RUFICAUDATUS*; but on the back the fulvous hue is very much deeper and the admixture of black is much greater: the short soft underfur is deep buff or fulvous, whereas in *L. RUFICAUDATUS* the same is whitish or rather almost pure white.\*

5. From Mr. A. Harris. A specimen of *SQUILLA RAPHAIDEA*, Fabricius.

6. From Babu Rajendra Mallicka. Fresh specimens of *GOURA CORONATA* and *CARPOPHAGA SYLVATICA*, which have been prepared as skeletons; and a kitten of *FELIS BENGALENSIS*.

7. From the Barrackpore menagerie. A carcass of *PRESBYTIS MAURUS*, fœm., and one of a doe Antelope, *A. CERVICAPRA*.

8. From Capt. Robt. Tytler, 38th Lt. Infantry. Sundry specimens of Rats and of Bats, chiefly from the vicinity of Barrackpore; and examples of *HESPESTES NYULA* and *H. AUROPUNCTATA* from the Midnapur district.

9. From Dr. McGowan, Ningpo. Two valves of a species of *AVICULA* mussel, with extraneous substances introduced artificially and encrusted with *nacre* or 'mother of pearl' deposit, as noticed in p. 188, ante.

10. From Capt. Thos. Hutton, Masuri. A collection of Bats taken out of spirit and sent down with camphor in a closed tin canister, which proves to be a most excellent mode of transmitting small animals from a distance. Of nine species, at least four are European and included with more or less justice in the *Fauna Britannica*. These are *BARBASTELLUS COMMUNIS*, Gray, *MYOTIS MURINUS*, (Geoff.), *M. PIPISTRELLUS*, (Schreber), and *SCOTOPHILUS SEROTINUS*, (Schr.) Of two other species of *SCOTOPHILUS*, one only differs a little in colour from a specimen sent by Mr. H. E. Strickland as *Sc. DASYCARPUS*, (Leisler); and the other would seem to be undescribed.† Three species of *RHINOLOPHUS* sent are *RH.*

\* Hares are unknown in Arakan and in the Tenasserim provinces; also throughout the Malayan peninsula and archipelago, with the exception of *LEPUS NIGRICOLLIS*, F. Cuv., in Java, which has most probably been introduced from S. India or Ceylon, as it doubtless likewise has in the Mauritius; but we have met with several notices of Hares in the Indo-Chinese countries, even in Cochin China, the species being as yet undetermined.

† As so many of the European species of Bats thus extend their range to the Himalaya, we may look out with some confidence for others. As regards *PLECOTUS*, for instance, upon the most careful comparison of fine English specimens of *PL. AURITUS* with the description of *PL. HOMOCHEOUS*, Hodgson, *J. A. S.* XVI, 894, the only difference we can detect is that the Himalayan *PLECOTUS* would seem to have shorter fur above; a most unsatisfactory distinction, and only one specimen of it had been observed: and good examples of *VESP. LABIATA*, Hodgson, much require to be compared minutely with equally good examples of the European *NOCTULA*.





TRAGATUS, Hodgson,\* RH. MACROTIS, Hodgson, and a species found also in Lower Bengal which appears to be RH. MINOR, Horsfield, and (in its occasional rufous phase) *Rh. subbadius*, Hodgson.†

E. BLYTH.

March 2nd, 1852.

*Report of the Curator, Museum of Economic Geology.*

*Geological and Mineralogical.*—We have received, from Dr. Kelaart of Ceylon, two specimens of Granite, one of which is a garnet granite, the Garnets being of the Essonite or Cinnamon-stone variety. It also contains some minute semi-crystallised dull black-green grains which may be hornblende or tin ore, but the only assay I could take from such a small specimen leaves it uncertain if the reduced metal was iron or tin.

*Economic Geology.*—Captain Sherwill has sent us from Singrowlee in Rewah—

Native Copper from near the fort of Burdee on the Soane River ;

Copper Pyrites ;

A fine red *Gossan* of Copper from that quarter ;

Gold Dust Sand from Jushpore ;

Coal of a very fine appearance ;

Galena, Iron ore, Iron Pyrites, Limestone and Zinc Blende.

The first and last articles of this list are the most remarkable ; the Copper for its purity (and Captain Sherwill's informant says there is plenty of it!) and the zinc ore as being a novelty in Lower India,‡ and both may be

\* Perhaps the RH. MITRATUS, nobis, *J. A. S.* XIII, 483, may prove to be no other than this, though the ear-conch (in the dried specimens) would seem to be somewhat larger ; and the additional Indian species now ascertained to those above noticed, are RH. AFFINIS(?), Horsfield, from Ceylon, vide p. 346, *ante*,—RH. ROUXI, Temminck,—and RH. PEARSONII, Horsfield, 'Catalogue of the specimens of Mammalia in the Hon'ble Company's Museum' in London.—Of the affined genus HIPPOSIDEROS the ascertained Indian species are those mentioned in my last Report, p. 346, *ante* ; and the curious genus CÆLOPS, nobis, *J. A. S.* XVII, 251, is evidently much affined to MORMOOPS of Leach, figured in *Lin. Trans.* XIII, t. 7, p. 77, now ascertained to inhabit Cuba,—and to CENTURIO, Gray, ('Zoology of the Voyage of the Sulphur'), uncertain whether from Amboyna or from S. America : but it has not the singularly elevated cranium of the former genus, nor is the ear-conch bifid to the front, as in both the others. The tail and inter-femoral membrane resemble those of CENTURIO ; and the middle finger has three phalanges, whereas that of CENTURIO has four (as generally in the PHYLLOSTOMA group).  
† Vide p. 347, *ante*.

‡ The only Indian Ores of Zinc which we have till now are from Jawar in Ajmeer (See Journal Vol. XIX, p. 212) presented by Captain Brooke.





cited as another instance of how much we have to discover on all sides of us.

From Captain Haughton, 1st Asst. to the Governor General S. W. Frontier, we have received a larger specimen of the Serai Kela Copper Ore which is composed of an impure earthy Oxide of Iron and Copper, with Silicates, Carbonates and Sulphurets of Copper.

From the Rev. F. Fitzgerald, we have received some specimens of the Auriferous Quartz Rock of North Carolina.

I have put into the form of a notice for the Journal my account of another Amalgamation experiment made with 14 lbs. of the Argentiferous Copper ore (*Pacos* and *Colorados*) from the Deoghur mine, for which we are again indebted to Captain Sherwill, and it will be seen that the result has fully justified my anticipation of finding a richer ore than those we before experimented upon.

H. PIDDINGTON,

*Curator, Museum Economic Geology.*

LIBRARY.

The following books have been presented to the Library since the last meeting.

Bombay Magnetic and Meteorological Register, 1848. Bombay, 1851. 4to.—BY THE SUPERINTENDENT OF THE OBSERVATORY.

Icones Plantarum Asiaticarum, Part III. Monocotyledonous Plants. By Dr. W. Griffith. Calcutta, 1851, 4to. (2 copies).—BY THE GOVERNMENT OF BENGAL.

Notulæ ad Plantas Asiaticas, Part III. Monocotyledonous Plants. By Dr. W. Griffith. Calcutta, 1851, 8vo.—BY THE GOVERNMENT OF BENGAL.

Journal of the Indian Archipelago, for January, 1852, 2 copies.—BY THE SAME.

Memoirs of the Royal Astronomical Society, vol. XX.—BY THE SOCIETY.

Monthly Notices of the Royal Astronomical Society, vol. XI.—BY THE SAME.

The Oriental Christian Spectator, for February, 1852.—BY THE EDITOR.

The Missionary, for March, 1852.—BY THE EDITOR.

The Oriental Baptist, for April, 1852.—BY THE EDITOR.

The Calcutta Christian Observer, for April, 1852.—BY THE EDITORS.

The Upadeshak, for April, 1852.—BY THE EDITOR.

The Citizen, for March, 1852.—BY THE EDITOR.

Purnachandrodaya, for March, 1852.—BY THE EDITOR.

The Tattwabodhini Patrikā, No. 104.—BY THE TATTWABODHINI SABHA.

Bibidhārtha Sangraha, No. 4.—BY THE EDITOR.

RAJENDRALAL MITTRA.



# *Chronological Register kept at the Surveyor General's Office, Calcutta, for the Month of April, 1852.*



Observations made at Apparent Noon.

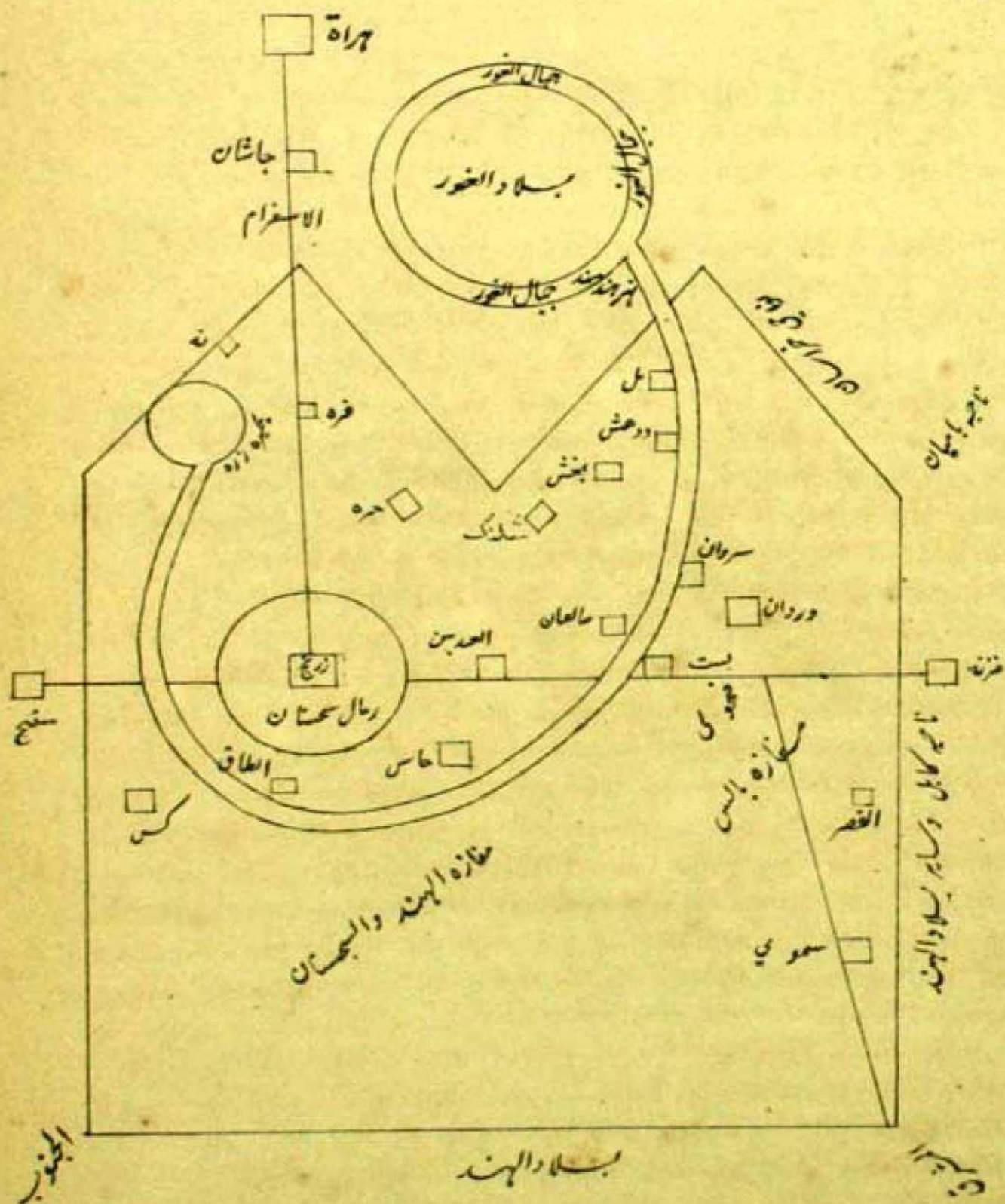
Maximum Pressure observed at 9 h. 50 m.

Observations made at Sun-rise.

Observations made at Sun-rise.				Maximum Pressure observed at 9 h. 50 m.				Observations made at Apparent Noon.			
Temperature.		Wind.	Aspect of Sky.	Temperature.		Wind.	Aspect of Sky.	Temperature.		Wind.	Aspect of Sky.
Of Mer.	Of Air.	W. Bulb.	Direction at Sun-rise.	Of Mer.	Of Air.	W. Bulb.	Direction at 9h 50m.	Of Mer.	Of Air.	W. Bulb.	Direction at Noon.
°	°	°		°	°	°		°	°	°	
77.2	77.3	70.2	Cloudy	78.0	79.0	71.8	Cloudy	84.4	85.6	73.6	Cloudy
73.8	73.7	70.4	Cirro-cumuli	79.4	81.3	75.2	Cirro-strati	85.2	87.0	76.4	Cirro-cumuli
77.0	77.6	75.5	Cumuli	83.4	84.4	78.8	Cumulo-strati	87.3	88.4	79.2	Clear
72.3	72.3	70.0	Cirro-cumuli	80.2	82.2	72.6	Clear	84.4	85.0	73.6	Ditto
75.4	75.7	73.6	Ditto	81.4	84.0	76.0	Cirro-cumuli	86.7	88.4	75.8	Ditto
77.0	77.8	76.3	Cloudy	82.8	85.0	78.6	Clear	88.0	90.0	78.5	Ditto
76.2	76.0	74.4	Cirro-strati	82.3	84.5	73.0	Ditto	89.6	92.0	70.2	Ditto
74.0	73.8	71.0	Ditto	82.3	85.4	74.0	Ditto	90.6	93.6	69.4	Ditto
78.0	77.9	75.8	Ditto	84.4	86.2	74.7	Cirro-cumuli	89.2	91.2	74.6	Cirro-cumuli
78.5	78.3	76.0	Clear	85.3	87.4	78.3	Clear	91.0	93.6	78.3	Clear
79.0	78.8	77.0	Cirro-cumuli	85.3	87.6	76.6	Ditto	90.2	92.0	75.4	Ditto
76.0	75.5	69.8	Clear	83.0	85.0	71.2	Cirro-cumuli	88.0	89.5	73.6	Ditto
76.0	76.3	74.4	Ditto	86.0	88.3	77.0	Clear	90.8	93.0	77.2	Ditto
78.2	78.2	76.3	Ditto	85.9	88.0	79.0	Ditto	91.7	94.0	76.5	Ditto
79.4	79.2	77.4	Scattered clouds	86.4	89.0	78.9	Cumuli	91.7	92.2	75.6	Cumulo-strati
79.3	79.4	77.4	Cirro-cumuli	86.5	89.2	78.6	Clear	91.7	93.7	76.5	Clear
79.0	79.2	77.0	Cirro-strati	86.8	89.0	78.2	Ditto	92.4	95.0	78.2	Ditto
78.8	78.4	77.0	Clear	86.3	88.6	80.4	Ditto	90.6	92.2	81.4	Ditto
79.0	79.0	77.5	Scattered clouds	86.7	88.4	81.0	Cumuli	92.0	93.8	81.6	Ditto
79.5	79.2	77.8	Clear	87.0	89.6	82.6	Clear	93.2	95.4	82.6	Ditto
81.0	80.5	78.2	Ditto	88.0	90.0	81.8	Cumuli	92.6	94.2	83.2	Ditto
81.4	81.4	78.0	Cloudy	88.0	89.6	81.0	Ditto	91.7	93.0	82.4	Cumuli
82.2	82.3	79.4	Ditto	86.0	88.4	81.3	Cumulo-strati	91.8	93.6	81.6	Cumulo-strati
79.4	80.6	78.9	Ditto	87.0	88.4	78.4	Ditto	90.3	91.0	79.2	Cirro-strati
80.0	80.0	78.4	Cirro-strati	83.6	86.5	81.3	Cirro-cumuli	91.4	93.3	82.8	Ditto
75.5	74.9	70.3	Drizzly	83.6	86.5	77.3	Ditto	90.3	93.0	78.3	Ditto
75.0	75.3	71.8	Cirro-strati	84.4	86.5	78.0	Cirro-strati	89.5	91.8	79.4	Clear
79.8	79.8	77.2	Ditto	86.0	88.6	75.4	Ditto	91.6	93.4	78.0	Cirro-strati
79.8	79.8	76.8	Ditto	88.8	91.0	81.4	Ditto	92.9	94.4	82.6	Cirro-cumuli
76.4	76.6	73.2	Cirro-cumuli	85.0	86.8	80.4	Cloudy	86.2	87.8	81.2	Ditto
77.8	77.8	75.2	.....	84.8	86.9	77.8	.....	89.9	91.7	77.9	.....
				29.841		29.806	.....				.....



الشيخ





# JOURNAL

OF THE

# ASIATIC SOCIETY.

No. V.—1852.

*Ibn Huokul's Account of Seestan, translated by Major WILLIAM  
ANDERSON, Bengal Artillery.*

“ I have added to the Map of Seestan, the boundaries on the various sides. On the East, the deserts between Mukran and Sind and Mooltan : on the West, Khorasan with a few districts of India ; on the North, India, Ghoor, Khorasan and Koomes ; on the South, the deserts between Seestan, Fars and Kerman.

The towns of Seestan and the bounding districts are, Zurunj, Keyun, Noh, Tak, Koheen, Khash, Furrub, Churruh, Bost, Zurdan, Serwan, Zalkan, Bugnee, Dejh-Guz, Buk *Gurmabuk*, Bishling, Punjwace, Kohuk, Ghuznee, Kusr *Quetta*, Seewee ; Espungulee, Haman.

The chief town is called Zurunj,—having both a city and suburbs, the city contains a castle, and is surrounded by a ditch ; while the suburbs have a mere wall. The water in the ditch is partly from springs in it, and partly from surplus irrigation. The gates are five : the Judeed and the Ateek both leading to Fars, at no great distance from each other ; the Kurkoonuh leading to Khorasan ; the MEESHUK leading to Bost ; the Tam leading to the various suburban villages. The most frequented is the Tam gate-way : all the doors are covered with iron.

For the suburbs there are thirteen gate-ways :—

The Meena ; in the direction of Fars.

The Joorjan ;

The Sarol ;

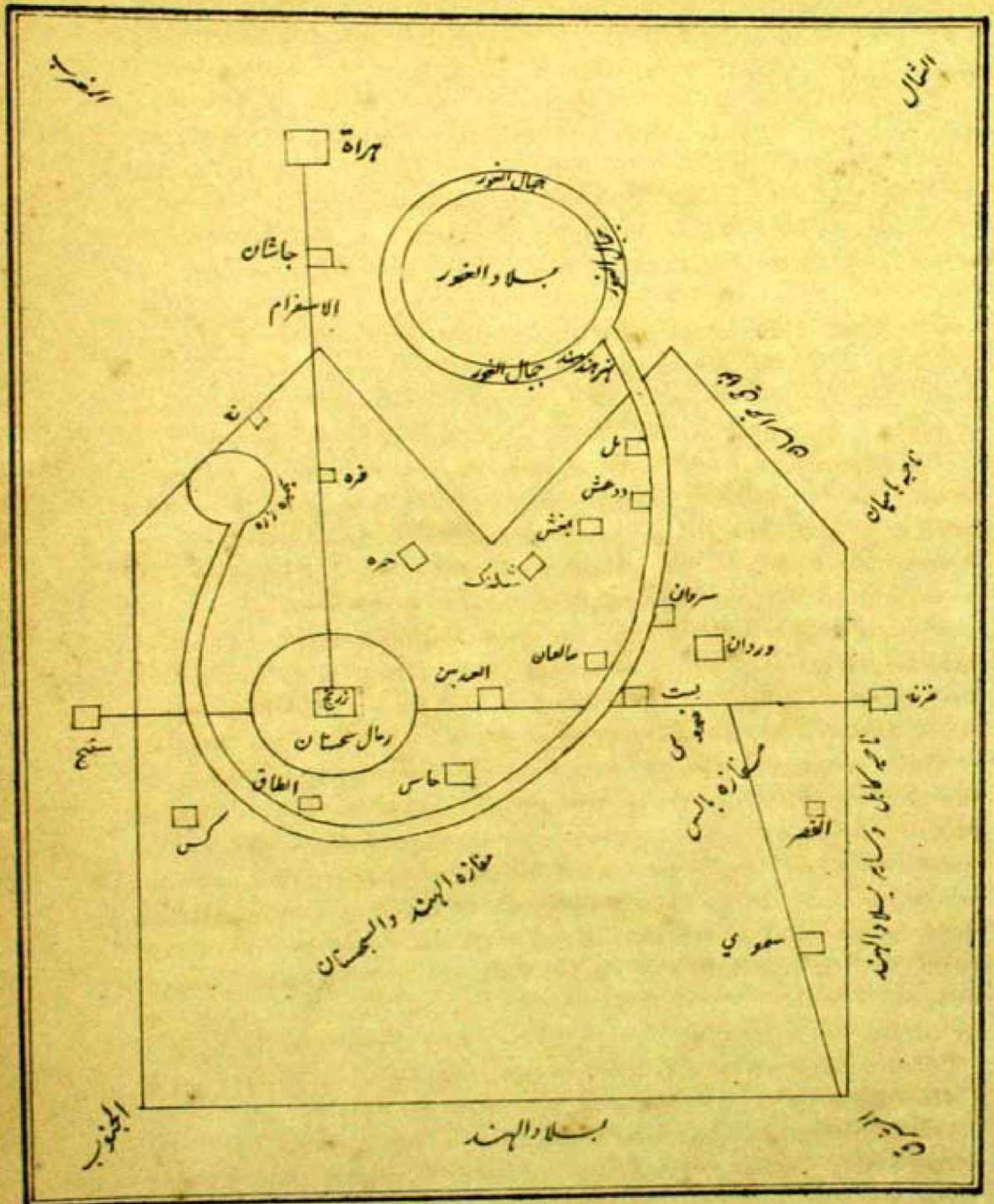
The Setara ;

The Shaeb ;

The Lookheek ;

No. LV.—NEW SERIES.









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No. LV.—NEW SERIES.



also flow into the Zeruh Lake. The river of Furrub rises in the country of Ghoor, as does the stream called Meeshuk also flowing into the lake.

Seestan is highly productive, abounding in grain and fruits and grapes. The inhabitants to appearance are comfortable. Large crops of Assafetida are gathered in the deserts which lie between Seestan and Mukran; the people often eat it as food; and mix it very generally in all their cooking.

Buloochistan is the name of a country in which is the town called Seewee, but the chief resides at QUETTA; ESPONGULEE is larger than Quetta. Rukhuj is the name of a district of which a town is PUNJWAE and another KOHUK, this district lies between Buloochistan and Zumeendawur; the inhabitants are mostly weavers of woollen cloth; much money is paid as revenue from this district; much grain is also produced, as the country is both fertile and extensive.

Zumeendawur is a productive spot being bounded by Ghoor, BUGNEE, Khuluj BISHLING and KHASH; the town of Zumeendawur is without walls but has a citadel; it is also the name of the district of which are towns called GURMABUK and DEZ GUZ both situated on the banks of the Helmund. But in Bugnee, Khuluj, ZABUL, and Ghoor with their dependencies, some of the people are on terms of alliance, and some have become Mohummedans. These places are all very cold locations.

The Khuluj is a Toorkee tribe, which for ages, has wandered between India and Seestan to the South of Ghoor; they are rich in cattle like other Toorkee tribes, their dress and language are similar to those of Erak; they wander to Meroe and visit India as merchants.

Bost is a city larger than any other in the government of Seestan, except Zurung—but it is not salubrious; although very fertile at all seasons; having both dates and grapes.

KOOHEEN is a small place, but having villages and hamlets attached; it is situated one march from Seestan on the left of a traveller to Bost, about two fursukhs from SUROOR; the family of Suffar which ruled over Fars, Kerman, Khorasan and Seestan came originally from this place. They were four brothers called Yakoob, Omur, Taher and Ulee, sons of Lues. Taher was killed at the gate of Bost; his grave is there. Yakoob died at Jund Shapore on his return from Baghdad, at which place he is buried. Omur was killed and buried at Baghdad.



Ulee contrived to win his way to safety in Joorjan, he departed life in the Dehestan where he was interred. Yakoob was the eldest in years and a slave in some of the Sufar families. Omur was by trade a carrier, and it is said worked for some time as bricklayer. Ulee was the youngest in years, but he was the cause of their rebellion and subsequent rising in the world. They had a maternal uncle called Kubeer, the son of Rumadegan, who was a leader of a party against the Khowarej.

He was shut up in a Fort called Kufeel but escaped, and then went on to Bost; at this time there was a man called Dêrhem, the son of Nusr, in these parts, who was as the head of a number of men who were outwardly anxious for a holy war and for the destruction of the Khowarej. The above four brothers were followers of this chief.

They advanced into Seestan; the Governor, on the part of Taher had not any great force, so they held a conference at the gate of the city, where Derhem-ben Nusr apparently professed his allegiance and proceeded on to attack the Khowarej: he then caressed the people, until they joined him; when he returned and obtaining entrance into the city, ejected the Governor, established himself and then destroyed many of the Khowarej party.

Ammar son of Yaser was the leader of this sect—Yakoob proceeded and killed him.

This circumstance caused his rise in rank; the people were delighted with him, while he so won the affections of those in authority round Derhem-ben Nusr, that they placed him in the government. Every affair centered in Yakoob, until Derhem became his servant, but he did not behave well to Derhem who took leave on excuse of making a pilgrimage to Mecca.

After a residence of some time in Baghdad, Derhem returned to Seestan as an ambassador, from the Khalef, he was immediately killed by Yakoob. The affairs of this leader then so prospered, that he became chief in Seestan, and the confines of Scinde and India. In those countries many received the religion of Eslam from the hands of Yakoob; he then rose to power in Kerman, Fars, Khozestan, a portion of Erak and Khorasan.

TAK is a town one march behind a person going from Seestan to Khorasan, a small place, but with villages, which produce a vast quantity of grapes used by the people.





**KHASH** is at a distance of one march from Koheen on the left of the road to Bost about half a fursukh ; larger than Koheen ; producing dates and trees, both places are well watered by streams and Kareez.

**Furuh** is larger than any of these places ; having villages at least to the extent of sixty ; with dates, fruits and corn, watered by the Furuh rood ; its houses are built of clay, but the surface is level.

**CHURUH** is near to the boundary of Furuh on the rights of the Khorasan road, about one march ; a small place like Koheen, but with villages and hamlets ; very fruitful, watered by Kareez. The houses are made of mud.

**SERWAN** is a small place like Koheen, but better peopled, producing fruits, dates and grapes ; at a distance of two marches from Bost ; the first march being Ferooz Mund, and the second Serwan on the Zumeendawur road.

**ZALKAN** is one march from Bost ; producing fruits, dates and corn, most of its inhabitants are weavers ; its waters are from canals, but its houses of clay ; about as large as Koheen.

**Zurkan** is less than Koheen, it is near Feroozmund on the right of the Rukhuj road. Much salt is produced, with corn and fruits ; water is plentiful.

#### Marches between Seestan and Herat.

Kurkoonuh, . . . . .	3 f.
BASHTUR, . . . . .	{ 4 f. crossing the bridge of a canal from the Helmund. (The Bashtrood).
Joween, . . . . .	1 m. Map.
Busunt, . . . . .	1 m. unknown.
Kufjur, . . . . .	1 m. ditto.
Sershuk, . . . . .	1 m. ditto.
Bridge over the Furrub river,	1 m. Map.
Koosar, . . . . .	{ 1 m. doubtful.
Kookshekar, . . . . .	
Jashan, . . . . .	1 m. Chah Juhan ?
Kareez Serce, . . . . .	1 m. Serace, Map.
Jubul-ol-uswud, . . . . .	1 m. Seyahkoh.
Haman, . . . . .	1 m.
Herat, . . . . .	1 m.

#### Marches from Seestan to Bost.

Dahook, . . . . .	1 m.
Suroor, . . . . .	{ 1 m. a royal populous village ; Chag- nasoor.



Horooree, . . . . .	{	1 m. over a brick bridge on the Mee-shuk river.
Dehuk, . . . . .		1 m. District.
Abshoor, . . . . .		1 m. Map.
Guzre dubeer, . . . . .		1 m. doubtful.
Huft Chah, . . . . .		1 m. Map.
Ubdallah, . . . . .		1 m. Map.
Bost, . . . . .		1 m. Map.

From Dehuk to within a fursukh of Bost, the whole country is desert.

Marches from Bost to Guznee.

Feerooz Mund, . . . . .		1 m. unknown.
Mueghoon, . . . . .		1 m. doubtful.
Kuebur, . . . . .		1 m. ditto, a fragment apparently.
Punjwae, . . . . .		1 m. a town of Rukhuj.
Tukeenabad, . . . . .		1 m.
Khoomsunuh, . . . . .	{	I suggest Homuk the district of Kulate Gulzaee.
Sereusp, . . . . .		Map.
Ukool, . . . . .		Map.
Chungulabad, . . . . .	{	A native acknowledged he had heard the name.
Urmur, . . . . .		Doubtful, may be Ghoojan.
Khast, . . . . .	{	Introduced from three other books, unknown, I suggest Khost, and Mokur, the last is well known and about where these marches would fall.
Khoomuk, . . . . .	{	
Khabser, . . . . .	{	Frontier of the Ghuznee territory, unknown.
Khusajee, . . . . .		I suggest Karabagh.
Hudwah, . . . . .	{	A well peopled place; Huzardeh, I suggest.
Guznee, . . . . .		

From Punjwae to Buloochistan.

Robat Hujur, . . . . .		
Tungee, . . . . .		A robot towards the Khojuk range.
Bur, . . . . .		Unknown.
Esjab, . . . . .		Espungulee, I suspect.

Marches to Kerman and Fars.

Haroot robot, . . . . .	1 m.
Daruk, . . . . .	1 m.



Buzur-deen,.....	1 m.
Gaomeshuk,.....	1 m. Gaopulung, Ouseley.
Rasek,.....	1 m.
Kazee,.....	1 m.
Gooraghan,.....	1 m.

Mushtuk, 1 m.; the half-way town between Seestan and Kerman. On leaving Gaomeshuk half-way to Kondur exists a robat, built by Omur: the place is called the Bridge to Kerman although there is no bridge whatever on the spot.

Various distances.

From Seestan to Furruh, 3 marches.

From Furruh to Churruh, 2 marches.

From Furruh to Kooheen, 2 marches.

From Noh to Furruh, 1 easy march; near the desert

From KEYUN to Seestan, 30 fursukhs; on the borders of Kerman.

To Tak on the Keyun road, five fursukhs.

Khash; from the road to Bost, one fursukh, and from Koheen one march.

From Bost to Serwan two marches on the Zumeen dawur road.

The Helmund is crossed one march beyond Serwan; when you enter the district of Buk (Gurmabuk)—and proceed on one march to Dez Guz both on the same bank of the river. From Gurmabuk to Bugnee one day's march among the Khuluj tribes; Beshling is to the South of Bugnee.

Punjwae is at the back of Guznee; while Kohuk is about one fursukh from Punjwae from the South.

From Punjwae to Espungulee, three marches.

Quetta is opposite to Espungulee at a distance of a fursukh.

From Espungulee to Seewee two marches."

#### NOTES.

Having premised, that there exists no possible form within reasonable limits into which proper names in manuscript may not be traced and that several liberties have been taken to obtain from the text even a shade of meaning, I proceed to offer my authorities for the readings I have adopted.

Before me lie four copies of this work; Sir Wm. Ouseley's from the Persian: Sprenger's copy of Ibne Huokul; Estukhuree as edited by Moeller; the printed copy of Edresee translated into French.



I do not touch on those places whose histories are well understood.

*Meeshuk*.—This is the gate leading to the districts watered by the river of this name. Edward Conolly calls the river Chabulk; but adds, that it rises at a spring called Meeshuk.

*Urk, or Urg*.—Is the Greek *αρχ*.

*Kundahar*.—The identification of Kundahar with the Greek Arachotia is acknowledged.

*Kuweed*.—The written word is Kureen, but a native who knew the country suggested the name I have given.

*Burg*.—I have taken in preference to Lool; doubtful.

*Assafætida*.—The district is, to this day, celebrated for this drug.

*Quetta*.—So I read قصر as a corruption or translation of كونه

*Espangulee*.—I offer, for a word written differently in each book; it is a well known village at the exit from the Koochlag range, whence two main roads diverge, one to India viâ the Bolan,—one to Sonmeyanee viâ Khozdar.

*Kohuk*.—Is situated as indicated subsequently; is a place on a hill, the scene of one of General Nott's battles.

*Punjwæe*.—Is a celebrated village or rather town ten miles West of Kundahar. I never understood it had any claims to antiquity, or to the honour of being the capital of the district; though ancient mounds were said to exist near it. Nor do I think the sense of the Arabic warrants the assumption of its being the capital.

*Bugnee*.—Is a district bounding Zumeendawur; visited by Captain G. L. Cooper.

*Bishling*.—Is so written and is so noted as a district next to Baghran by Captain Cooper in the sketch of his route.

*Khash*.—Is the district at the head of the Khash river.

*Gurmabuk*.—Almost all the books indicate Buk or Bug; which appears to have a district acceptation, as Bugnee, Bughran, Bukwa; but I treat it as the final fragment of the word given; because it states subsequently, "at one march from Serwan, you cross the Helmund on the road to Zumeendawur; and enter the district of Bug on the banks;" this our Artillery under Captain Hawkins did; marching from Serwan to Zumeendawur and crossing at Gurmabuk. At the same time the ruins of forts are numerous, and the capital has no other proper name than that of the district.



*Dez Guz.*—But for being declared on the banks of the river, I should have read this word *Durghosh* which exists as a large place some thirty or forty miles East of the river. Colonel Sanders in his survey down the *Helmund*, 10 miles above *Serwan*, places the district of *Guz*. *Dez* or *Dezh*, is *Puhluwee* for a fort.

*Zabul.*—Most books have *Kabul*, but the word given is clearly the one required, as the old name for the districts of *Subswar* and *Furruh*.

*Kooheen.*—Distinctly so written in a copy of the *Nozut ol Koloob*, as the birth place of the *Suffar* family.

*Suroor.*—Now called *Chugnusoore*: *Edward Conolly* halted at the fort; and says, the definition given to him was, *Khanuhesoor* or the house of gladness; *Rostum* having at it celebrated his marriage.

*Tak.*—Now exists; was visited by *E. Conolly*.

*Khash.*—The present fort; as located.

*Churruh.*—Was seen and determined by *Colonel Sanders*.

*Serwan.*—The fort of the modern *Serban* or *Serwan* district; as placed.

*Zalkhan.*—Is now one of the first canals taking off from the *Helmund*, in the district of *Gurumseer*.

*Zurkan.*—Unknown.

*Bashtur.*—Is, I have no doubt, the correct reading—all our copies differ. I can understand, as knowing the irrigation system that the canal called *Bastrood* ran to this place.

*Road to Guznee.*—The most unsatisfactory of all the identifications are of this route; few of them are complete or happy: and yet our surveyors have been constantly up and down the road. *Tukeen* or *Tugeen* is, I suspect, the chief who built or resided in the old city of *Kundabar*, if the two places mentioned are to be considered one city. Near the *Turnuk* are ruins of a place called *Jukan*, about 12 miles higher up the road; *Shuhre-Sufa* would better break the distance. *Homukee* is the district of *Kulate Gulzaee*. It must be remembered, that words much used and often quoted by Europeans, have but little currency. I give this route entire as written in each of the four copies; a specimen of the dependence to be placed in manuscript.

*Keyun.*—The ruins of *Keyunabad* near *Bum*.

The greatest indulgence is craved for these attempts; nothing but local knowledge will ever be sufficient to correct such vitiated manuscript. If individuals from the countries would each undertake to correct the portion within his immediate knowledge, we might hope at last, to obtain a correct version of the original. I anticipate that it will ultimately be found, that the names of places have changed much less than is supposed.



Route from Bost to Guznee as copied from ERNE HUOKUL, Es-  
TUKHREE, EDREESIE and OUSELEY.

Proposed reading.	اوزلي	ادريسي	اصطخوري	ابن حوقل
	فيروزمند	فيروز	فيروزمند	فيروزمند
	معون	معون	معون مغور	ميفون
	کر	کير	کدر	کدر
	رخچ	رخچ	رخچ بحري	رخچ فنجواي
	نسکين اباد	ميکن اباد	بکيدر اباد	تکين اباد
حومکي	خراسانه		خراسانه حرساه	حومسناه
سراسپ	سيراپ		سراب	سرام
	ادمي	اوق		اومد
	جنکل اباد	جیکل اباد		حدکل اباد
اغوجان	دهيه عوم	عزير		عومر
	خاست	حاست	خاسب	
مقر	جومه	خومته	خومه	
	خابسار	حاسان		حامسار
قرا باغ	خساجي	حسراجي		حسامحي
هزارديه	هزاردهي	حروي		ددوه
	غزنه	غزنه	غزنه	غزنه



*Note by A. SPRENGER.* The original MS. from which this account of Afghanistan and the account of Sind which has been published by Major Anderson with most valuable remarks and identifications in p. 49 of this volume, have been taken is in the Moty Mahall library at Lucknow. It is a volume in folio of 276 pp. 17 lines in a page. We are informed in the postscript that it had been copied in A. H. 589 from a "very correct" MS. The first leaf of the book and consequently the beginning of the preface is wanting, and we are therefore left in ignorance as to the name of the author. The title of the book is according to the postscript *Ashkál albilád* or *Diagrams of the country (of the Islám)*. The diacritical points are wanting in most instances and many letters cannot be well distinguished from each other. The book was copied for me in 1847 with great care, and subsequently it was compared with the original, but the copyist has in doubtful instances decided in favour of the most likely reading, and no doubt sometimes he has gone wrong. It is therefore much to be regretted that this copy is the only one available for Major Anderson.\*

Though the beginning of the preface is wanting, the greater portion of the Introduction is preserved.

It contains the plan of the work which I give here in a translation. "Then (after having given a map of the world), I have devoted a separate Diagram to every country of the Islám, in which I show its frontiers, the shape of the country, the principal towns, and in fact every thing necessary to know. The Diagrams are accompanied by a text. I have divided the dominions of the Islám into twenty countries; I begin with Arabia, for this peninsula contains the Ka'bah, and Makkah which is unquestionably the most important city and the centre of the peninsula; after Makkah I describe the country of the Bedouins, then I proceed to the description of the Persian gulph which surrounds the greater part of Arabia, 3. the Maghrib, 4. Egypt, 5. Syria, 6. the Mediterranean, 7. Mesopotamia, 8. the 'iráq, 9. Khuzistán, 10. Fáris, 11. Kermán, 12. Mançúrah and the adjacent countries,† which are Sind, India and part of the Moḥammadan territory, (in India,) 13. Adzarbayján, 14. the districts of the Jibál,

\* Since writing the above, I sent the proof-sheet of the original text to Capt. H. F. Hayes, Asst. Resident at Lucknow, who has obligingly compared it with the original MSS. in Moty Mahall.

† Here a space of about six inches is left blank, and in the margin are the words;  
صورة الكل تقدمت في الورقة التي يتلوا هذا

"This space is for the Map of the World (but it is not large enough, therefore the copyist has deviated from the original from which he transcribed) and it stands in the opposite page."



15. Daylam, 16. the sea of the Khazar (i. e. the Caspian), 17. the steppes between Fâris and Khorásán, 18. Sijistán and the adjacent countries, 19. Khorásán, 20. Má-wará-l-nahr."

Of every one of the above countries there seems to have been originally a map, but two have been lost (viz. No. 6 and 10) and some have been transposed (as well as several leaves of the text) by the book-binder. A full notice of the book has been given by Sir H. Elliott, *Ind. Historians*, I. p. 61.

On comparing the *Ashkál albilád* with Möller's *Içtakhry* it appears that it is somewhat fuller. There are details in the former which are omitted in the latter, thus we find in it the names of the gates of Ghaznah, which are omitted by *Içtakhry*.

In like manner we find in other instances that where there are names and facts in the *Ashkál* we meet in *Içtakhry* with a general account, I therefore conclude that *Içtakhry* is an abridgment of the *Ashkál*. A man who is able to give new facts on every country of the Islâm, if he had lived after *Içtakhry* would certainly have written an original work and would not have added them to the meagre account of *Içtakhry*. We find most of the clerical errors in the orthography of proper names in *Içtakhry* which are in the *Ashkál*. If the *Ashkál* was an *enlarged* edition of *Içtakhry* it would certainly be also an *improved* one, for a man who can add is able to improve whereas an epitomator does not necessarily possess such a qualification.

*Ibn Hawqal* seems to be a more recent edition of the *Ashkál albilád*. There are, as far as I know, few if any new facts mentioned in *Ibn Hawqal* but the expression is in a few instances changed.

### واما سيجستان وما يتصل بها

وما قد جمع اليها في الصورة فان الذي يحيط بها مما يلي المشرق مفازة بين مكران وارض السند وبين سيجستان وشيء من عمل الملكان ومما يلي المغرب خراسان وشيء من عمل الهند ومما يلي الشمال ارض الهند ومما يلي الجنوب المفازة التي بين سيجستان وفارس وكرمان وفيما يلي خراسان والغور والهند وفارس وهذه صورة سيجستان .

واما مدنها وما يقع في اضعافها مما يحتاج الى معرفته فلها من المدن زرنج وكس ونه والطاق والغزدين وخواش وفرة وحره ولشت وزردان وسروان وصالقان ولعس ودرعس وبل ولسلعل وفتحوای وكهل وغرنه والقصر وسدومي واسمخاي وحامان ومدينتها العظمى تسمى زرنج ولها مدينه وريض



وعلى المدينة حصن وخندق وعلى الرض أيضاً سور والماء الذى  
فى الخندق ينبع من مكانه ويقع فيه أيضاً ويصل من المياه ولها خمسة  
ابواب احدها الباب الجديد والاخر الباب العتيق وكلاهما يخرج منهما الى  
فارس وبينهما قرية والباب الثالث باب كركونه يخرج منه الى خراسان  
والباب الرابع باب مدسك يخرج منه الى لشت والباب الخامس تعرف بباب  
الطعام يخرج منه الى الرساتيق واعمر هذه الابواب باب الطعام وهذه الابواب  
كلها جديد وللرض ثلاثة عشر باباً فمنها باب سدايخذ الى فارس ثم يليه باب  
جرجان ثم يليه باب سدرل ثم يليه باب شتارا ثم يليه باب سعدب ثم اليه باب يوحيك  
ثم يليه باب الكاز ثم يليه باب مدسك ثم يليه باب كركونه ثم يليه باب اسدرلس  
ثم يليه باب عنجرة ثم يليه باب مارسدان ثم يليه باب روبروان وابنيقها كلها  
طين ازاح معقودة لان الخشب بها يسوس ومسجد الجامع فى المدينة دون  
الرض واذا دخلت من باب فارس ودار الامارة فى الرض بين باب الطعام  
وبين باب فارس خارج المدينة والحلس فى المدينة عند مسجد الجامع  
وهناك أيضاً دار الامارة على ظهر مسجد الجامع وعند الحلس ولكنها نقلت  
الى الرض وهناك بين باب الطعام وبين باب فارس قصر يعقوب بن الليث  
وقصر لعمر بن الليث ودار الامارة فى دار يعقوب بن الليث وداخل المدينة  
بين باب كركونه وباب مدسك بنية عظيمة تسمى اول كانت خزانة بناها عمر  
بن الليث واسواق المدينة الداخلة حوالى مسجد الجامع وهى اسواق على  
غاية العمارة واسواق الرض عامرة منها سوق تسمى سوق عمر بن الليث  
وقفه على مسجد الجامع والبيمارستان والمسجد الحرام وغلة هذه السوق  
فى كل يوم نحو الف درهم وفى المدينة الداخلة انهار منها نهر يدخل من الباب  
العتيق والثانى من الباب الجديد والثالث يدخل من باب الطعام ومقدار  
هذه الانهار اذا جمعت ما يدير الرضى وعند مسجد الجامع حوضان عظيمان يدخلهما  
الماء الجار ويخرج ينصرف فى بيوت الناس وسرايهم ومعظم دور المدينة  
والرض فيها ماء جار وبساتين وفى روضها انهار تأخذ منها هذه الانهار التى تدخل  
المدينة والسوق ممتد من باب فارس من المدينة الى باب مينا متصل  
نحو نصف فرسخ وارضها سبخة ورمال وهى حارة بها نخيل ولا يقع بها ثلوج  
وهى ارض سهلة لا يرى منها جبل واقرب جبالها بفاحية فرج وتشد رياحهم  
وتدوم حتى انهم قد نصبوا عليها طواحين يديرها الهواء وينقل دمالهم من



مكان الى مكان فلولاً انهم يحتالون فيها لطمت على القرى والمدن بها وبلغنى انهم اذا احبوا نقل الرمل من مكان الى مكان من غير ان يقع على الاراضى التى الى جانب الرمل جمعوا حول الرمل مثل الحائط من شوك وخشب وغيرهما بقدر ما يعلو على ذلك الرمل ويفتحون فى اسفله باباً فتدخله الريح ويطير اعلى الرمل مثل الزوبعة فيرتفع حتى يقع على مد البصر حيث لا يضرهم ويقال ان المدينة القديمة فى أيام العجم كانت فيما بين كرمان وسجستان اذا حرت اول بحذار اسكر عن يسار الذاهب من سجستان الى كرمان على ثلث مراحل وابنيتهما وبعض بيوتها قائمة الى هذه الغاية واسم هذه المدينة رام شهرستان ويقال ان نهر سجستان كان يجرى عليها فانقطع فانقلع عليها بثق مكان سكر من هند مند وانخفض الماء عنه ومال فتعطلت وتحول الناس عنها ونواز رنج واما انهارها فان اعظم نهر لها هند مند ويخرج من ظهر بلد الغور حتى يخرج على حد رحى وبلدى الداور ثم يجرى على لشت حتى ينتهى الى سجستان ثم يقع فى بحيرة زرة وزرة هذه بحيرة يتسع المياه فيها وينقص على قدر زيادة الماء ونقصانه وطولها نحو ثلاثين فرسخاً من ناحية كرس على طريق قهستان الى قنطرة كرمان على طريق فارس وعرضها مقدار مرحلة وهي عذبة الماء ويرتفع منها سمك كثيرة وقصب وحواليها كلها قرى الا الوجه الذى يلي المفارة ونهر هند مند هو نهر اخذ من لشت الى ان ينتهى الى مرحلة من سجستان وتنشعب منها مقاسم الماء فأول نهر ينشق منه نهر الطعام فيأخذ على الرساتيق حتى ينتهى الى حد مسك ثم يأخذ منه نهر باشتروود فيسقى رساتيق كثيرة ثم يأخذ منه نهر يسمى سارود فيجرى على فرسخ من سجستان وهو النهر الذى يجرى فيه السفن من لشت الى سجستان اذا امتد الماء ولا يجرى اليهم السفن الا فى زيادة وانهار مدينة سجستان كلها من سارود ثم ينحدر فيأخذ منه نهر سعده فيسقى مقدار ثلاثين قرية ثم يأخذ منه نهر يسمى مدلىن فيسقى رساتيق كثيرة ثم يأخذ منه والوفيسقى رساتيق كثيرة وما يبقى من هذا النهر يجرى فى نهر يسمى نول وقد سكر هناك سكر يمنع الماء ان يجرى الى بحيرة زرة حتى يجى المد فاذا جاءت ايام المد زال السكرود وقع فصل هذا النهر الى بحيرة زرة وعلى سكر هند مند على باب لشت جسر من السفن كما يكون على انهار العراق ويقع فى بحيرة زرة الفاصل من وادى فره وغيرها من تلك النواحي ومن انهار سجستان نهر فره يخرج من قرب الغور حتى يسقى تلك النواحي ويقع فضله



فى بحيرة زرة ونهر نسيك يخرج من قرب الغور فيسقى تلك النواحي وقل  
 مايفضل منه لبحيرة زرة وسجستان خصبة كثيرة الطعام والثمار والاعذاب اهلها  
 ظاهرو اليسار ويرتفع من مغارة سجستان فيما بينها وبين مكران غلة عظيمة  
 من الحلثيت حتى انه قدغلب على طعامهم ويجعلونه فى عامة اطعمتهم  
 وبالس اسم الناحية ومدينتها سري غيران الوالى مقيم بالقصر وسبعجان اكبر  
 من القصر وزرنج اسم الاقليم ومدينتها سحرى ولها من المدن كهل ورخج اقليم  
 من بلدى الداور وبين بالس وعامتها صوافى يرتفع ليست المال منها مال  
 عظيم ويتسع اهل تلك النواحي بغلاتها وهى على غاية الخصب والسعة وبلاد  
 الداور اقليم خصب وهو ثغر للغور وبس وحلج وشتك وحانين وليس عليها  
 سور وبها قلعة وبلد الداور اسم الاقليم ومدينتها بل ولها من المدن درعى  
 وههنا على مجرا هند مند على الشط غيران بعس وحلج وكابل والغور وهذه  
 النواحي بعض هؤلاء قد اسلموا وبعضهم مسالمون وهى من الصرود والحلج  
 صنف من الاتراك وقعوا فى قديم الايام الى الارض التى بين الهند ونواحي  
 سجستان فى ظهر الغور وهم اصحاب نعم على خلق الاتراك وزيهم ولسانهم  
 واما لشت فانها مدينة ليس فى اعمال سجستان بعد زرنج اكبر منها الا انها وبيّة  
 وزيهم زى العراق يرجعون الى مرو ويسارو بها متاجر الى بلد الهند والسند  
 وبها نخيل واعذاب وهى خصبة جدا واما الغزيس فانها مدينة صغيرة لها قرى  
 ورساتيق وهى على مرحلة من سجستان عن يسار الذهاب الى لشت على  
 فرسخين من سرودن منها الصفارون الذين تغلبوا على فوارس وكرمان  
 وخراسان وسجستان وكانوا اربعة اخوة يعقوب وعمر وظاهر وعلى بنواليث  
 فاما ظاهر فانه قتل بباب بست واما يعقوب فانه مات بحدسابور بعد  
 رجوعه من بغداد وقبره هناك واما عمر بن الليث فانه قتل ببغداد وقبره هناك  
 واما على بن الليث فكان استا من الى راقع بجرجان ومات بدهستان وقبره  
 هناك ويعقوب كان اكبرهم وكان غلاما لبعض الصفارين واما عمر فانه كان  
 مكاريا بلغه انه كان فى بعض ايامه بناء وكان على بن الليث اصغرهم سدا  
 وكان السبب فى خروجهم وارتفاع امرهم ان خالا لهم يسمى كثير بن رماد كان  
 قد يجمع اليه جمع فى وجوه الخوارج محصور فى قلعة تسمى قفيل وتخلص  
 هؤلاء وقعوا الى ارض بست وكان تملك الناحية رجل عنده جمع كثير يظهرون  
 الحسبة فى الغزو وقاتل الخوارج يسمى درهم بن نصر قصار هؤلاء الاخوة فى



جملة اصحابه فقصدوا سيجستان واولى بها الطاهري وكان في ضعف فنزل على باب المدينة وكان درهم بن نصر هذا يظهر انه من المطوعة وانه قاصد بقتل الشراة محتسبا فاستمال العامة حتى مالوا اليه ودخل المدينة وخرج منها واليها الى بعض النواحي فتمكنوا من البلد وقتلوا الشراة وكان للشراة رئيس يعرف بعمار بن ياسر فانتدب لقتاله يعقوب فقتله وقتل عمارا وكان لا يحزبهم امر شديد الا انتدب له يعقوب فكان يرتفع ذلك الا منزله ما يحبه فاستمال اصحاب درهم بن نصر حتى قلدوه الرياسة و صار الامور له وكان درهم بن نصر بعد ذلك من جملة اصحابه وما زال مُحسناً الى درهم بن نصر حتى استأذنه في الحج واقام ببغداد مدة ثم رجع رسولا من امير المؤمنين اليهم فقتله واستفحل امرهم بعد ذلك حتى استولوا على سيجستان وما يتصل بها من اطراف السند والهند ومهدوا تلك الثغور واسلم على يدي يعقوب خلق منهم ثم استولى بعد ذلك على كرمان وفارس وخورستان وبعض العراق وعلى خراسان واما الطاق فانها مدينة على مرحلة يكون على ظهر الجاه من سيجستان الى خراسان وهي مدينة صغيرة ولها رستاق وبها اعذاب كثيرة يتسع بها اهل سيجستان وخواش وهي من فرس على مرحلة عن يسار الذهاب الى بست وبينها وبين الطريق نحو نصف فرسخ وهي اكبر من فرس وبها نخيل واشجار وبها وبالفرس مياه جارية وقنى واما فره فانها مدينة اكبر من هذه ولها رستاق يشمل على نحو من ستين قرية وبها نخيل وفواكه وزروع وعليها نهرة و ابنيقها طين وهي في ارض سهلة وحررة متصل بعمل فره عن يمين الذهاب من سيجستان الى خراسان على نحو من مرحلة وهي مدينة صغيرة نحو الفرس ولها قرى ورستاق وهي خصبة وما واهم من القنى وابنيقهم من طين وسروان مدينة صغيرة نحو الغزيس الا انها اعمر من الغزيس وبها فواكه كثيرة ونخيل واعذاب وهي من بست على نحو مرحلتين احدى المنزلتين يسمى فيروزقند والآخر هرشروان على طريق بلدى الدوار وصالقان من بست على مرحلة وبها فواكه ونخيل وزروع واكثر اهلها حاكه وما واهم من انهار وبنواهم من طين وهي نحو الغزيس في الكبروزقان هي اصغر من الغزيس وهي بقرب فيروزقند عن يمين الذهاب الى رنج واكثر غلاتها الملح ولهم مع ذلك زروع وفواكه ومياه جارية واما المسافات بها فان الطريق من سيجستان الى هراة اول مرحله تسمى كركوبه على ثلث فراسخ ومنها الى سياربعة فراسخ ويعبر على قنطرة يجرى فيها



ما فضل من مياه هند مند ومن بسر الى جوين مرحلة ومن جوين الى بست ومنه  
الى كفجر مرحلة ومن كفجر الى سرمد مرحلة ومن سرمد الى قنطرة وادي فرة  
مرحلة ومن قنطرة الوادي الى فرة مرحلة ومن فرة الى درة مرحلة ومن درة  
الى كوسار مرحلة وهي اخر عمل سچستان ومن كوكسار الى حاستان وهي من  
الاسفرار مرحلة ومن حاستان الى فناه سري مرحلة ومن فناه سري الى الجبل  
الاسود مرحلة ومن الجبل الاسود الى حامان مرحلة ومن حامان الى هراة  
مرحلة واما الطريق من سچستان الى بست اول مرحلة الى راندوق ومن راندوق  
الى سرورن قرية عامرة سلطانية ومن سرورن الى حروري قرية عامرة سلطانية  
وبينهما نهر لاسك وعليها قنطرة معقودة من اجرو من حروري الى دهل والمنزل  
رباط من حدد هل ومن هذا الرباط المفازة فمنازل منها رباط يسمى ارصور ومن  
ارصور الى رباط كرو ويدرو من كرو ويدرو الى رباط قهستان ومن رباط قهستان الى رباط  
عبد الله ومن رباط عبد الله الى بست ومن رباط دهل الى فرسخ من بست كلها مفازة  
واما الطريق من بست الى غزنه فان من بست الى رباط فيروزقند منزل ومنه  
الى رباط ميغون منزل ومنه الى رباط كندر منزل ثم الى مدينة الرخج المسماة  
نحواي منزل ومنها الى بكن اباد منزل ثم الى خومستان منزل ثم الى رباط  
سرام منزل ثم الى الاود وهو رباط منزل ثم الى رباط حنكل اباد منزل ثم الى  
قرية عرمر منزل ثم الى حاصار منزل وهو اول حد غزنه ثم الى قرية حساحي  
منزل ثم الى رباط هدوة منزل وهي قرية عامرة ثم الى غزنه منزل ومن سچستان  
الى بالس طريق على المفازة تاخذ من مدينة الرخج المسماة نحواي الى رباط  
الحجر منه منزل ثم رباط حنكل منزل ثم الى رباط برمنزل ثم الى رباط استحاب منزل  
واما الطريق من سچستان الى كرمان وفارس فان اول حد ينزل من سچستان  
حاروت والعاي رباط يسمى دارل ومن دارل الى نرس منزل ومنه الى كارمسك  
منزل وهما رباطان ثم الى رباط الناس ثم الى رباط القاضي منزل ثم الى رباط كوراعان  
منزل ثم الى سلج منزل وسمي مدينة من كرمان وحد سچستان اذا حرت كاد ينسك  
بينها وبين كندر رباط نباه عمرو وهذا المكان يعرف بقنطرة كرمان وليس هناك  
قنطرة ولكن تسمى كذلك وسائر المسافات بسچستان من سچستان الى حرة ثلاث  
مراحل بين فرة والغزيس وبينها وبين فرة ايضا مرحلتان وبين نه و فره نحو  
مرحلة راجحه وهي بحداثها مما يلي المفازة وبين كس وبين سچستان ثلثون  
فرسخا مما يلي حد كرمان والطاق على طريق كس على خمسة فراسخ وخواش



عمكن فرسخ من طريق بست وبينه وبين القرون منزل ومن بست الى سروان  
مرحلتان على طريق بلاد الداور ثم تعبر هند مند على مرحلة من سروان فيدخل  
بل ويمضي مرحلة الى روعس على شط هند مند كلاهما من جهة واحدة ومن  
بل الى بعس يوم في قدي بل والسبل في جنوبي بعس وفتحواي على ظهر  
غزته بينها وبين كهل مقدار فرسخ عن غربي فتحواي ومن فتحواي الى سفتجان  
ثلاث مراحل والقصر يحاذيها وبينهما فرسخ ومن سفتجان الى سيوي مرحلتان

*Abstract of Registers of Temperature and Fall of Rain kept by  
Medical Officers in different parts of India, by DR. LAMB.*

MY DEAR DR. SPRENGER,

I have the pleasure to send you, for presentation to the Society, Abstracts of Registers of Temperature and Fall of Rain chiefly obtained from observations by medical officers of this Establishment or on duty within the limits of the Presidency.

Coming from such variety of sources it is obvious that perfect reliance is not to be placed on them all, and I fear that in some instances the mean temperature is not very accurately set down. But on the other hand many of the Registers sent to the Medical Board, have been kept with great care, and besides the Items I have abstracted, there are minute details of the variations of atmospheric pressure, direction of the winds, and other matters not susceptible of being easily given in abstract.

The temperature given as the mean is in all cases the mean of the day, i. e. from sunrise or a little before it till sunset, and is from  $2^{\circ}$  to  $4^{\circ}$  above the mean of the twenty-four hours, as ascertained in a good many cases where I have had an opportunity of making the comparison.

Calcutta, 29th April, 1852.

G. LAMB.



## Abstract of Mean Temperature of the Day and Fall of Rain, from Registers kept by

	Height above the level of the Sea.	Latitude.	Longitude.	January.		February.		March.		April.		May.	
				Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.
Calcutta, .....	18.11	22.33.01	88.20.34	71.2	0.07	..	2.41	85.5	1.05	88.7	3.75	92.9	0.08
Barrackpore, ..	..	22.42.35	88.25.4	72.5	0.24	70.5	1.17	85.7	0.24	90.	2.79	95.5	0.55
Hooghly, .....	..	22.53.24	88.26.34	68.5	0.95	68.	0.65	80.4	..	85.	2.10	89.	..
Jessore, .....	..	23.9	89.10.30	64.	0.40	72.	0.0	80.	0.0	86.	3.85	94.	0.50
Kishuaghur, ..	..	23.24.	88.22.20	70.	2.50	69.	1.20	94.	..	96.	2.60	99.	..
Burdwan, .....	..	23.13.10	87.52.20	70.5	0.30	76.5	1.10	83.	0.30	86.	0.40	90.	..
Moorsheadabad, 76.	..	24.11.50	88.13.20	63.	0.20	65.5	1.65	79.2	..	83.	2.35	88.	2.55
Rungpore, .....	..	25.42.50	89.14.50	65.3	1.10	68.7	0.10	79.8	0.50	82.6	3.70	86.2	9.70
Bauliah, .....	..	24.23.15	88.33.45	66.3	..	71.6	0.60	81.3	0.20	85.9	0.23	90.8	0.32
Beerbhoom, .....	..	23.54.25	87.34.00	69.5	..	73.1	0.60	82.7	1.16	86.9	2.50	92.2	..
Bancoora, .....	..	23.14.8	87. 6.31	71.9	0.90	74.	0.93	82.4	1.10	89.	4.22	95.	1.00
Balasore, .....	..	21.30.7	86.58.11	72.9	0.30	74.9	0.27	85.8	1.20	87.5	3.35	96.	0.09
Midnapore, .....	..	22.25.13	87.19.25	69.	0.26	69.	0.23	74.	1.54	81.5	1.74	87.	..
Poorie, .....	..	19.48.09	85.49.10	71.6	..	75.6	0.40	82.	..	85.	1.00	88.	0.50
Cuttack, .....	..	20.28.55	85.54.15	72.	0.10	78.	0.04	82.5	0.25	86.	1.66	94.	0.75
Dacca, .....	22.	23.43.10	90.23.40	67.3	0.69	71.	0.99	82.5	..	84.	4.28	88.2	2.73
Akyab, .....	..	20.8	92.56.	71.5	..	73.8	..	76.9	..	83.	..	85.1	11.34
Sandoway, .....	..	....	....	78.	..	81.	..	..	..	85.	0.50	83.5	15.18
Ramree, .....	..	....	....	65.5	..	66.	..	75.	..	77.5	..	81.	7.00
Chittagong, .....	..	22.20.30	91.47.30	67.7	..	72.9	1.90	80.3	..	81.7	2.55	80.6	7.46
Tipperah, .....	..	23.27.30	91. 5.40	69.2	0.75	71.4	1.25	77.	..	82.1	5.50	83.3	3.12
Burisaal, .....	..	22.35.40	90.17.	66.	..	72.6	2.50	82.5	..	84.8	3.18	88.6	1.14
Pubna, .....	..	....	....	70.3	0.55	74.	1.60	80.7	..	84.2	2.30	87.5	..
Bogra, .....	..	....	....	61.	0.72	68.2	1.70	76.	1.22	83.5	1.20	86.8	3.35
Mymensing, ..	..	24.44.50	90.24.20	62.	0.75	64.7	3.25	75.1	0.50	77.3	5.30	82.8	7.25
Sylhet, .....	..	24.53.	91.50.30	67.7	0.30	69.6	4.50	76.5	2.15	77.7	19.35	81.5	43.35
Cherrapoonjee, 4500	..	25.16.35	91.43.55	53.7	0.75	55.1	3.05	65.3	1.30	67.1	27.60	69.3	115.15
Gwalpara, .....	..	26.11.	90.40.	64.2	0.70	66.1	0.70	76.1	1.05	77.6	10.20	79.3	15.10
Gowahuttee, ..	..	26.11.15	91.47.10	66.4	0.51	68.3	0.47	77.5	1.45	78.9	5.57	81.1	6.64
Cachar, .....	..	24.48.40	92.47.17	62.5	..	66.	..	76.7	..	77.7	12.11	81.6	27.78
Seeksagar, .....	..	....	....	60.	0.84	62.3	4.39	70.5	1.06	72.8	8.85	77.6	12.53
Tezapore, .....	..	26.36.45	92.50.10	65.2	..	65.2	1.87	74.	2.07	77.3	4.27	79.1	9.58
Debroghur, .....	..	27.31.45	95. 1.	63.6	0.61	63.7	5.49	73.1	2.25	73.5	9.43	76.2	14.45
Nowgong A. ..	..	....	....	..	..	66.5	2.85	72.4	2.10	75.8	8.55	79.	8.85
Dinapore, .....	..	25.37.45	85. 5.10	63.6	1.75	67.7	1.	78.5	2.	87.8	..	96.4	..
Tirhoot, .....	..	26. 7.20	85.26.15	61.8	3.75	65.2	1.45	75.7	0.90	84.2	..	91.9	..
Dinapore, .....	..	25.37.30	88.41.00	69.	0.80	71.	0.80	82.5	0.30	89.5	0.70	94.5	2.50
Purneah, .....	..	25.48.00	87.33.00	64.5	2.12	65.5	3.25	71.5	1.50	88.	2.00	84.5	0.75
Darjeeling, .....	7000	27.3	88.18.40	40.9	3.45	41.7	2.40	51.8	4.00	55.3	4.55	61.9	6.75
Sarun, .....	..	26.45.27	85.29.12	..	..	..	..	75.5	..	92.5	..	93.	..
Monghyr, .....	..	25.27.26	86.43.38	65.5	0.85	68.	1.25	76.5	0.20	84.5	..	92.5	1.40
Hazareebaugh, ..	..	24. 0. 0	85.24.20	64.3	0.	65.4	1.00	76.8	0.35	83.	0.40	89.1	0.50
Gyah, .....	..	24.48.44	85. 3.16	70.	0.30	72.	1.25	79.8	..	91.	..	96.9	..





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## Abstract of Temperature and Fall of Rain.

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Medical Officers at Civil and Military Stations in Bengal and N. W. P., for 1851.

June.		July.		August.		September.		October.		November.		December.		
Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	
87.1	8.39	84.7	12.89	86.1	10.78	86.7	8.49	83.1	16.25	78.5	..	71.8	..	64.16
87.	6.04	83.5	9.71	87.	7.39	87.	3.82	84.5	10.80	74.9	..	67.3	..	42.75
85.	5.75	83.	9.60	84.5	4.20	84.5	2.75	82.7	10.00	71.2	..	62.5	..	36.00
94.	8.60	85.	9.90	91.	4.40	90.5	5.40	86.	7.15	80.	..	..	..	40.20
92.5	4.15	84.	23.	85.	10.75	85.	11.	84.	2.50	75.	..	66.	..	57.70
88.5	3.25	85.	8.85	86.8	5.20	87.2	2.55	82.	5.65	73.	0.60	..	..	28.20
85.5	4.61	82.7	10.67	88.	7.75	88.	3.60	83.	7.10	75.	0.00	68.	..	40.48
83.7	23.90	84.5	11.70	84.5	14.40	87.1	6.30	80.	3.20	79.	..	70.6	..	74.60
86.1	6.88	85.	11.56	87.	4.95	87.5	3.35	81.3	3.30	72.2	0.17	..	..	31.56
88.6	3.50	85.3	11.30	86.2	5.40	86.9	2.70	82.	4.90	75.3	..	69.7	..	32.06
90.6	4.43	86.7	8.76	87.7	2.75	88.2	4.05	..	2.90	73.5	..	73.7	..	31.04
95.5	3.22	89.	5.86	89.5	3.65	82.	3.40	83.	9.10	72.	0.15	55.5	..	30.79
86.5	3.10	81.5	4.44	84.	4.13	83.5	..	77.	7.34	69.	..	62.	..	22.78
86.7	4.50	85.4	14.30	86.2	7.35	85.6	4.45	83.	blown down.	76.1	..	72.6	..	
92.	7.31	84.	10.20	86.	12.11	86.	6.10	79.	11.65	..	..	75.	..	50.17
84.2	18.78	86.3	13.76	85.3	10.30	85.6	4.70	81.9	12.70	75.7	..	69.5	..	68.93
81.	59.54	83.7	22.43	83.4	27.58	84.	17.57	83.1	14.09	81.5	..	75.1	2.52	155.07
81.5	52.18	82.7	30.64	81.7	37.49	81.4	29.67	81.3	10.90	80.7	1.30	74.7	0.62	178.48
81.	17.30													
76.6	25.88	78.1	13.11	79.1	7.99	80.5	16.27	77.2	10.75	72.8	..	67.5	0.42	86.33
80.6	19.50	81.5	16.08	82.2	25.25	81.2	11.00	78.4	13.50	72.7	..	66.1	..	95.95
84.5	20.70	83.3	17.90	82.5	21.00	84.3	6.90	81.8	21.15	75.6	..	69.5	..	94.47
84.	8.90	82.8	7.65	85.2	6.20	85.4	6.10	81.6	5.75	73.	..	66.	..	39.05
84.5	14.65	..	7.95	..	8.40	..	6.25	..	6.00	..	..	..	..	51.44
82.3	35.25	84.5	20.00	85.1	20.38	85.5	6.52	81.7	10.70	74.5	..	67.3	..	109.90
81.1	39.70	82.5	33.50	82.6	28.30	83.1	17.85	78.4	20.40	73.9	..	69.	0.45	209.85
71.3	147.20	71.8	99.40	72.4	103.90	72.4	71.70	68.2	40.30	..	..	..	..	610.35
79.9	42.55	81.3	17.90	81.8	11.65	82.1	7.40	77.9	8.85	71.6	..	65.8	..	116.10
81.6	16.61	84.7	9.35	83.8	4.53	83.3	3.05	80.3	3.68	75.1	0.38	69.1	0.50	52.74
83.1	15.35	83.4	15.60	85.	8.94	84.7	9.32	80.9	11.26	76.1	2.00	68.3	0.48	102.84
82.6	16.35	84.4	10.43	84.1	16.40	84.1	7.40	79.2	6.38	71.4	0.05	65.8	0.50	85.18
82.	16.82	84.5	4.50	83.3	16.58	83.2	4.50	79.4	3.00	71.2	..	66.1	0.30	63.49
80.4	12.85	83.4	13.74	82.2	18.42	..	11.98	..	17.73	..	..	..	..	106.95
81.4	17.50	83.9	7.35	83.8	22.20	82.8	4.65	80.1	7.00	70.6	0.40	66.	2.00	83.45
90.5	4.50	86.2	3.75	86.6	6.75	85.4	7.50	81.5	13.75	71.	..	62.3	..	31.
88.1	3.50	85.8	8.45	86.3	7.33	84.5	3.50	80.	4.50	69.	..	62.2	..	33.38
88.	12.50	..	12.70	89.5	6.70	89.5	3.20	85.	6.50	80.	..	73.	..	46.70
85.6	9.75	85.5	15.12	84.5	11.80	86.	3.35	79.8	3.75	71.7	..	65.	..	53.39
62.5	31.00	63.7	27.15	64.3	16.70	63.2	19.60	55.8	9.40	50.4	0.10	44.8	0.10	125.20
89.9	..	86.4	4.55	..	..	83.5	8.90	80.2	3.40	63.	..	59.6	..	
90.	8.20	86.	6.65	86.5	3.36	85.	8.10	80.5	6.65	70.5	..	..	..	36.66
86.2	8.76	79.9	7.95	79.3	5.70	77.8	5.65	73.5	0.90	69.5	0.85	64.7	..	32.06
92.7	3.25	86.5	9.35	89.8	3.25	86.4	4.25	83.	2.50	65.3	0.50	65.2	..	24.65



## Abstract of Mean Temperature of the Day and Fall of Rain from Registers kept by

	Height above the level of the Sea.	Latitude.	Longitude.	January.		February.		March.		April.		May.	
				Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.
Bhangulpore, ..	..	25.14.50	87. 0.00	66.7	0.75	72.5	1.50	80.	0.00	86.5	0.80	92.5	0.80
Benares, .....	..	25.18.26	83. 3.12	64.3	2.31	67.8	1.60	74.5	0.65	87.3	..	96.3	..
Goruckpore, ..	..	26.46.35	83.22. 6	62.2	3.60	65.4	0.20	75.	0.20	82.9	0.10	90.8	1.40
Azimghur, ....	..	26.32.	83.13.20	64.3	3.80	66.9	1.08	76.1	0.60	81.9	0.80	84.8	..
Sultanpore, ....	1050	26.15.35	82. 6.40	65.5	..	70.6	..	83.4	..	92.2	..	101	..
Mirzapore, ....	..	25. 9.19	82.37.23	60.	..	72.5	..	..	..	88.	..	96.	..
Ghazeepore, ..	..	25.34.25	83.37. 9	64.5	1.70	68.	1.40	79.	0.60	88.	0.00	95.	0.00
Juanpore, ....	..	25.43.48	82.44. 7	58.5	..	65.	..	74.	..	82.5	..	93.	..
Cawnpore, ....	..	26.28.15	80.23.45	62.6	..	67.6	..	76.9	..	88.1	..	95.3	2.00
Futteghur, ....	..	27.23.20	79.40.25	59.7	4.95	64.7	0.66	75.5	0.57	85.0	0.11	92.6	0.29
Mynpoorie, ....	..	27. 1.24	79.13.53	59.5	..	72.	..	83.	..	93.	..	103.	..
Etawah, .....	..	26.45.31	79. 3.18	61.	2.76	65.5	0.63	75.8	0.04	85.5	0.05	94.7	0.35
Humeerpore, ..	..	26. 7.49	79.47.22	..	1.50	58.5	0.80	78.5	..	95.	0.30	93.5	..
Oorai .....	..	....	....	..	..	..	..	..	..	..	..	86.5	..
Banda, .....	..	....	....	66.5	..	71.	..	77.2	..	92.	..	98.5	..
Futtepore, ....	..	26. 6. 2	80.24.18	58.5	..	61.2	..	70.	..	80.	..	90.2	..
Allahabad, ....	..	25.27.43	81.54.12	64.7	2.90	69.	2.00	80.6	..	92.6	..	100.1	..
Saugor, .....	..	23.50.	78.47.55	..	..	..	1.30	..	..	89.	..	91.5	2.00
Dumoh, .....	..	....	....	..	..	..	..	..	..	..	..	..	..
Nursingpore, ..	..	....	....	62.	..	67.	..	..	..	95.	..	100.1	0.31
Hoshungabad, ..	..	22.45.43	77.45. 5	..	..	..	..	79.	..	90.	..	94.	..
Baitool, .....	..	21.51.13	77.58.15	70.8	..	77.6	..	85.3	0.02	92.9	..	87.4	1.20
Seconie, .....	..	....	....	..	..	..	..	..	..	..	..	..	..
Jubbulpore, ..	..	23. 9.39	79.59.43	67.4	0.50	72.3	0.90	79.5	..	94.5	..	99.8	0.47
Nowgong, ....	..	25. 3.30	79.31.	65.7	3.92	70.4	0.66	..	..	91.6	..	96.4	0.33
Jhansee, .....	..	....	....	..	..	..	..	80.8	..	88.6	..	96.2	..
Agra, .....	..	27.10.26	78. 5. 4	57.5	1.18	68.	1.08	79.6	..	88.4	0.20	95.1	0.75
Neemuch, ....	..	24.27.30	75. 2.30	65.5	..	73.50	..	81.5	..	88.5	..	90.	..
Muttra, .....	..	27.28.42	77.22. 3	59.	..	..	..	77.	..	..	..	..	..
Erinpoora, ....	..	25. 9.15	73. 9.40	..	..	..	..	..	..	..	..	..	..
Allyghur, .....	..	....	....	..	..	..	..	..	..	..	..	..	..
Khewaree, ....	..	....	....	65.6	..	..	..	..	..	..	..	..	..
Beawur, .....	..	....	....	52.	..	63.5	..	71.5	..	80.5	..	87.	..
Bolundshur, ..	..	....	....	..	..	..	..	..	..	..	..	..	..
Ajmere, .....	..	....	....	..	..	..	..	..	..	..	..	..	..
Meerut, .....	..	29. 0.41	77.45. 3	58.5	..	64.8	..	74.1	..	83.1	0.60	86.1	..
Delhie, .....	..	28.31.23	77.13.39	55.2	2.60	62.2	0.30	71.1	2.60	86.4	0.96	98.6	0.05
Goorgaon, ....	..	27.53.24	77.24.35	..	..	76.	..	..	..	92.	3.30	104.	..
Moradabad, ....	..	29.12.49	78.59.46	..	..	63.5	..	72.5	0.10	81.5	0.50	92.	..
Bareilly, .....	..	28.12.17	79.34.45	60.5	2.85	63.0	2.90	76.	0.22	82.	..	..	..
Shajehanpore, ..	..	28. 1.35	79.35.11	58.	..	64.	..	74.	..	81.5	..	89.5	..
Scharunpore, ..	..	29.57.18	77.35.30	48.	..	55.5	..	61.5	..	72.5	..	84.3	..
Deyra, .....	..	30.18.58	78. 4.27	..	..	..	..	..	..	83.3	..	91.5	..
Almora, .....	5500	29.35.10	79.41.16	..	4.59	..	2.88	..	..	70.1	1.23	80.4	..





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*Abstract of Temperature and Fall of Rain.*

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*Medical Officers at Civil and Military Stations in Bengal and N. W. P., for 1851.*

June.		July.		August.		September.		October.		November.		December.		
Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	
90.5	10.45	87.	14.40	85.6	3.50	85.	2.35	82.	7.90	72.	..	66.5	..	42.45
92.7	6.30	86.5	7.10	86.	5.57	84.5	9.68	81.6	3.85	73.1	..	68.3	..	37.06
89.2	15.60	85.9	14.10	86.2	5.	84.7	9.90	80.8	11.60	70.4	..	63.2	..	61.70
88.4	4.48	85.3	8.72	86.4	3.83	83.8	9.45	81.3	7.20	71.3	..	64.3	..	39.96
96.1	..	88.	..	..	..	..	..	..	..	..	..	..	..	..
96.	..	..	..	..	..	..	..	84.5	..	71.	..	64.	..	..
94.5	8.40	88.	6.20	86.	5.70	86.	5.70	83.5	6.10	69.	0.00	64.	0.0	35.8
94.	..	..	..	..	..	..	..	80.	..	68.	..	57.5	..	..
95.8	..	86.3	..	86.9	..	77.5	..	77.5	..	72.	..	..	..	..
92.2	3.22	84.3	15.35	85.5	5.43	83.4	6.27	78.5	0.44	69.4	..	63.4	..	37.29
98.5	..	94.5	..	88.3	..	88.5	..	74.5	..	61.	..	..	..	..
94.7	0.87	91.5	11.40	87.5	9.23	82.5	6.16	76.5	0.29	70.7	0.01	62.7	0.05	31.84
93.5	6.70	89.	12.63	87.	10.54	86.2	4.81	82.5	0.64	68.2	..	..	..	37.92
91.5	..	83.5	..	84.5	..	78.5	..	73.	..	65.	..	..	..	..
93.	..	86.	..	87.5	..	83.	..	80.5	..	62.5	..	..	..	..
91.	1.10	90.	8.50	..	..	..	6.	77.5	1.20	..	..	..	..	..
96.3	..	88.9	..	91.8	..	88.	..	81.	..	75.6	..	68.8	..	..
92.	2.38	86.	14.77	81.2	12.40	76.5	13.23	76.5	1.26	65.5	..	63.5	..	..
..	..	..	..	82.5	..	79.	..	77.	..	68.	..	..	..	..
92.3	1.30	83.	17.67	81.5	7.38	80.1	10.96	79.2	0.41	74.3	0.59	68.5	..	..
90.	2.00	85.	14.	82.	9.50	81.	17.90	80.	1.25	70.	0.50	..	..	..
85.6	3.50	81.	14.50	78.7	8.90	79.5	3.70	82.5	..	67.8	0.20	70.8	..	32.02
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90.8	5.97	82.5	17.17	83.	3.93	79.6	8.22	79.5	1.34	70.8	0.37	65.5	..	38.87
94.8	3.92	..	..	..	..	84.6	..	84.3	..	74.6	..	67.9	..	..
94.4	..	..	..	..	..	81.1	..	85.1	..	73.6	..	65.7	..	..
96.1	0.30	86.3	9.80	85.4	9.95	83.6	3.98	81.2	0.57	67.4	..	..	..	27.81
86.	5.00	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85.5	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
93.5	4.00	86.7	14.70	87.5	5.10	85.	0.60	80.1	..	69.8	..	59.2	..	..
97.9	0.39	86.4	11.62	88.5	6.56	92.	..	81.5	..	68.8	..	59.6	..	25.08
104	..	93.5	14.10	87.	4.80	90.1	..	..	..	..	..	..	..	..
93.	..	86.	13.25	87.5	6.10	84.	4.70	84.	2.00	..	..	..	..	..
92.7	3.04	85.5	16.81	87.5	7.75	80.	1.75	77.5	2.70	..	..	56.8	..	..
94.5	..	89.	..	87.	..	82.	..	78.	..	..	..	..	..	..
94.8	..	86.	..	90.	..	82.	..	78.	..	68.4	..	62.6	..	..
85.9	..	83.	..	82.	..	80.	..	75.2	..	64.5	..	59.5	..	..
81.2	6.90	74.6	10.00	76.9	2.00	77.7	5.55	72.3	2.10	61.1	..	53.2	..	..









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*Abstract of Temperature and Fall of Rain.*

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*Medical Officers at Civil and Military Stations in Bengal and N. W. P. for 1851.*

June.		July.		August.		September.		October.		November.		December.		
Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	Mean temperature of the day.	Rain.	
93.2	..	88.	8.85	88.5	..	83.2	..	79.	..	..	..	..	..	..
92.	..	86.	..	87.5	..	87.	..	79.	..	..	..	..	..	..
69.6	11.65	67.8	23.95	69.2	24.69	65.1	5.67	61.5	2.36	50.1	0.31	47.9	..	82.31
..	..	..	..	..	..	68.	..	64.1	0.95	49.6	2.10	46.3	..	..
96.3	1.30	87.1	7.80	90.7	3.10	91.6	0.60	84.3	..	67.1	..	62.2	..	25.76
69.2	3.50	64.6	17.95	63.4	11.65	66.3	..	60.2	..	52.3	..	46.1	..	..
80.9	..	75.5	2.40	73.7	..	70.	..	67.9	..	..	..	..	..	..
73.9	3.00	70.5	22.13	70.6	6.50	72.1	..	66.2	..	..	..	..	..	..
97.5	0.74	88.8	18.81	93.3	0.18	94.	..	86.1	..	70.8	..	61.	..	23.13
92.9	1.50	86.1	10.62	88.4	2.50	88.9	..	82.	..	66.6	..	61.6	0.50	..
85.	2.	85.	16.	..	..	..	..	..	..	..	..	..	..	..
..	2.16	..	6.27	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	85.5	..	..	..	..	..	..	..	..	..	..	..	..
94.3	0.54	86.	..	89.3	..	87.8	..	76.5	..	..	..	..	..	..
89.4	1.78	85.9	..	88.3	..	86.	..	76.2	..	66.	..	59.4	..	..
92.9	..	86.	..	85.6	..	86.6	..	80.9	..	64.6	..	59.2	0.12	..
91.2	3.00	81.8	..	81.9	..	83.5	..	78.4	..	59.5	1.90	57.4	0.50	..
94.	..	..	..	..	..	85.	..	..	..	61.5	..	..	..	..
98.2	..	86.4	..	89.1	..	87.5	..	77.6	..	64.	0.60	59.4	0.10	..
94.7	1.54	87.3	..	90.3	..	90.1	..	82.	..	66.4	1.09	60.4	..	..
94.8	1.25	87.5	..	90.6	..	..	..	82.6	..	68.5	1.35	60.6	0.25	..
..	..	95.5	..	88.7	..	87.1	..	74.	..	60.6	..	57.5	..	..
93.	0.98	92.1	..	90.4	..	..	..	..	..	57.9	..	58.	..	..
90.9	3.70	85.5	..	83.2	..	85.7	..	76.2	..	45.	..	..	..	..
69.5	..	68.4	..	66.7	..	62.1	..	62.8	..	..	..	..	..	..
97.	..	..	..	90.	..	84.	..	..	..	55.	..	..	..	..
95.5	..	88.3	..	92.1	..	88.7	..	85.	..	67.	..	61.	..	..
81.5	..	84.1	..	81.7	..	84.	..	..	..	64.5	..	58.6	..	..
..	..	..	..	..	..	..	..	..	..	62.	..	..	..	..
..	..	..	..	..	..	..	..	..	..	63.	..	..	..	..
..	..	..	..	..	..	..	..	..	..	58.	..	..	..	..
95.5	..	..	..	89.5	..	82.	..	..	..	68.4	..	..	..	..
99.4	..	92.3	..	92.1	..	92.5	..	86.9	..	..	..	..	..	..
86.5	..	..	..	86.5	..	81.	..	..	..	56.	..	..	..	..
95.	..	..	..	93.	..	93.	..	..	..	67.	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..



*Memo. by Major M. KITTOE, Archæological Enquirer, on some Ancient gold coins found near Benares, in 1851, and submitted by the Government of India for the inspection of the Members of the Asiatic Society.*

These coins, which are all gold, of different weight and quality, were of a trove of ninety in number, that is, such number were delivered into the treasury. They were found, with about 70 more, by some villagers, buried in a copper vessel, in a mound on which stands the village of Bhursur, in purgunnah Bhurwal and Thana Chundowlee, about twelve miles from Benares, between the Ganges and Caramnassa.

Bhursur is the site of one of the many ancient cities the names of which are lost. The mound is high and extensive—there is a tradition of its having been the stronghold of the rajahs of old. A trench was being dug, when amongst some bricks and rubbish the trove was made: for some time it was kept a secret, the copper vessel was destroyed, and about 70 of the coins were sold and melted down; a dispute arose, when one of the disputants gave information, and they were confiscated.

Of the whole number 71 were coins of Chandra Gupta, 69 being of one type of his coinage. Of these, four were retained of the most perfect and the remainder were sold by auction; they were all more or less defective, and but few of them had even a portion of the legend round the rim perfect, but the name चन्द्रा Chandra beneath the left arm of the figure was distinct in all of them.

Of the 32 coins retained a list is here annexed.

The two last coins on the list are decidedly of an unpublished type, the name is not clear in either.

Some doubt may exist as to the reading of one of the Kumaras—on the obverse the letter क, “ku” (query short for Kumara?) is clear, but on the reverse it seems to read Sri Mahesha or Mahendra perhaps: the affix “Sri” seems to point to its being rather the name of the prince than his title—which is sometimes Ajeet Mahendra कृष्णदेव.



One of the coins reads  $\text{श्रीसुन्दरः}$  : "Sri Skanda Gupta" very distinctly—the name under the left arm is also clearly  $\text{सु}$  "Skanda," so that there can be no doubt of this specimen.

I must ever regret my inability, through press of other work to make accurate drawings of these coins, many of which are varieties not published hitherto in our Journal.

I would invite the attention of numismatologists to the variations in form of some of the letters of the Gupta alphabet, and to that of the letter "m" ( $\text{म}$ ) in particular, which in later times was changed to  $\text{म}$ ; for instance,  $\text{समुद्रा}$  is written  $\text{समु}$  which has been read as  $\text{समु}$

"asa." The letter  $\text{स}$  "s" changes to  $\text{स}$ , which has also been mistaken for  $\text{स}$  "a," and wrong readings and deductions consequently have resulted. The use of this form of the m and s ( $\text{म}$  and  $\text{स}$ ) is indicative of the later date of the coins on which found.

I am happy to place here on record that the result of following the plan proposed by me, of Government giving the bullion value of all coins thus found, has already proved beneficial, for a trove of silver coinage of the early Mogul Emperors was readily delivered up shortly after this collection of gold was paid for; and at the moment of writing these remarks I have before me twenty-one silver coins (Budhist) of a very early date, which will reach the Society in due course.

I would therefore suggest to the Society to address the Supreme Government upon this important matter, and obtain if possible decisive orders to all Revenue Officers and others to make known in their several districts that full value will be given for all troves of coinage—for it is lamentable to think what a vast number of such antiquities find their way into the melting pots of the village Sonars.

At the same time some inducement might be devised and held out for the due delivery in like manner of copper and brass plates, "Tamba pattra," which are often either kept concealed under the supposition that they are "beejucs" or keys to hidden treasure, or sold to brasiers and melted down. I know of two plates in the Benares Division both of which I have failed in procuring. The one at Kapia near Gorruckpore, the other about 30 miles hence near the Soane river; the latter was broken in two through the ploughman, who found it, doubling it up. The former I believe was uninjured.

M. K.





*Memo. by Mr. E. C. BAYLEY, Deputy Secretary to the Government of India, Foreign Department.*

The whole of these coins belong to the Kanouj Guptas, a dynasty who reigned apparently from the end of the first to at least the beginning of the 4th century, A. D.

Their coins are not very rare or important, and most of the coins in the present list have been already figured and described.

The coin No. 3 of Kumara Gupta is apparently new, as those of Sri Prakasa if correctly described, but there is no such name in any list or inscription.

Nos. 4, and 5 of Chandra Gupta, 4 of Kumara Gupta and 3 of Mahendra Gupta are apparently unimportant varieties of known types.—With the exception of these seven coins the lists contain little perhaps worth sending to the Court of Directors.

The proposition for giving the full value to the finders seems a just one—and one by which Government cannot suffer much loss; if this were done, Mr. Thomas, who will pass Benares in December or January next,\* might inspect all collected, and would then be able to give a decided opinion as to what coins might be worth sending to the Court—any rejected might be sold by public auction, due notice, with a short descriptive catalogue, being previously given.

8 kings of the dynasty are known.

(Signed,) E. B.

The references are given to the plates in Thomas's late *Kings of Guzerat*.

#### CHANDRA GUPTA.

1. 2. 3. Plate V. figure 20.
4. and 5. New apparently, but unimportant varieties of the above.
- No. 6. Plate VII. figure 6.

#### SAMUDRA GUPTA.

1. and 3. Plate IV. figure 16.
2. Plate V. figure 26, it is not a moon but a musical instrument which the figure holds.

\* The Memo. is without date, but was probably written in Sept. or Oct. 1851.  
—Eds.





4. Plate VI. figure 14.
- 5th. Reference in list to Asiatic Society's Journal.

**KUMARA GUPTA.**

1. Plate V. figure 28.
2. Plate VI. figure 20 probably Mahendra Gupta.
3. New—good.
4. Variety (unimportant) of No. 2.
5. Plate V. 30 also probably Mahendra Gupta.

**SKANDA GUPTA.**

1. and 2. Plate VI. figure 18.
3. Variety of above if not the same.

**MAHENDRA GUPTA.**

1. Plate VII. figure 5.
2. and 3. Plate VII. figure 4.

**SRI PRAKASA.**

1. and 2. New, if correctly read.

True Copies.

Signed, J. THORNTON,  
*Secretary to Govt. N. W. P.*

True Copy.

Signed, E. A. READE,  
*Commissioner.*

True Copy.

M. KITTOE, Major,  
*Archæological Enquirer.*



*Descriptive Catalogue of Ancient Gold Coins found at Bhursur, Pergunnah Bhurwal, Thanah Chundoulee, in the Benares District.*

No.	Weight and quality.	Description.		Remarks.
CHANDRA GUPTA.				
1	Grains 124.	Obverse. Figure of raja with halo round his head, facing to his right, a Peacock Standard to right hand, in his left hand holds a bow, the word "Chundra" placed vertically under left arm : चन्द्र for Chundra Gupta.	Reverse. Female figure seated on Conch Shell throne, (?) holding a noose in her right hand, and a lotus flower in her left, inscription to the right श्रीविक्रम. "Sri Vicrama;" emblem.	The standard which Mr. Prinsep conjectures to be an Owl or an Eagle, is evidently the Peacock, the cognizance of the early kings; it is seen very distinctly in the copper coinage of this king.
2	Grains 130.	Figure of raja turned to the right with halo round his head, Peacock Standard, wheel or discus emblem of universal monarchy, in left hand holds a bow, under left arm "Chandra," as in the foregoing.	Female figure as in No. 1. Emblem श्रीविक्रम; legend श्रीविक्रम.	Of inferior gold. (Plate xii. fig. 1.)
3	Grains 126.	Figure of raja facing the right with halo round his head, Peacock Standard, the Crescent, left hand holds a bow, the word "Chandra" below left arm.	Female figure as in No. 2. Emblem श्रीविक्रम; legend श्रीविक्रम half apparent.	This is a smaller coin, and the gold is pale and alloyed. (Plate xii. fig. 2.)



N<sup>os</sup> 1 to 9 were found in Benares; the rest in Jessore.

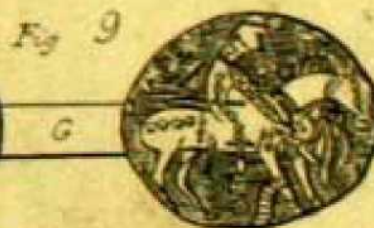
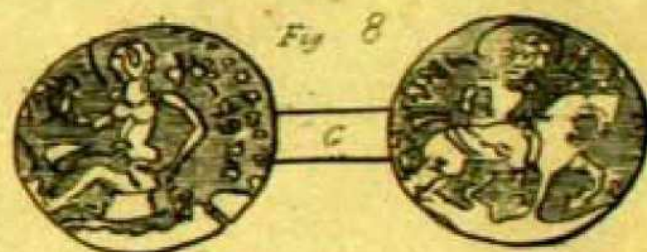
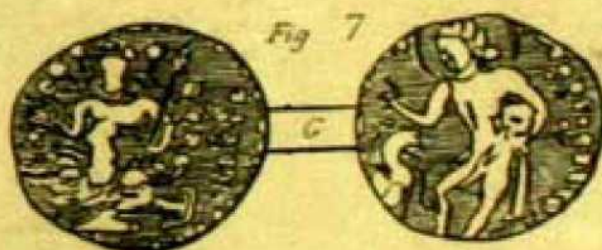
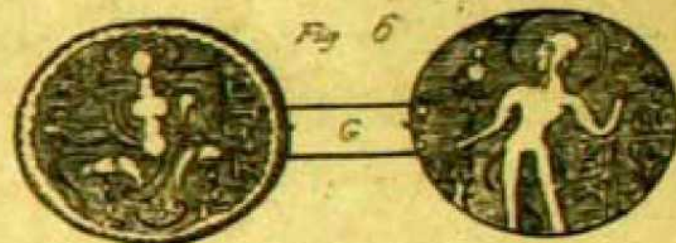
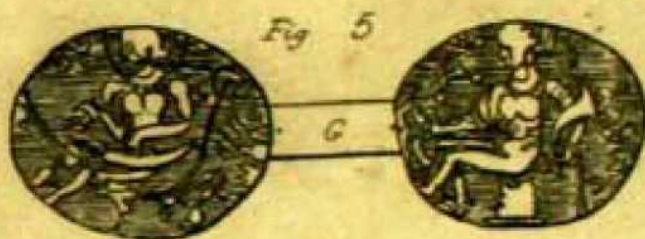
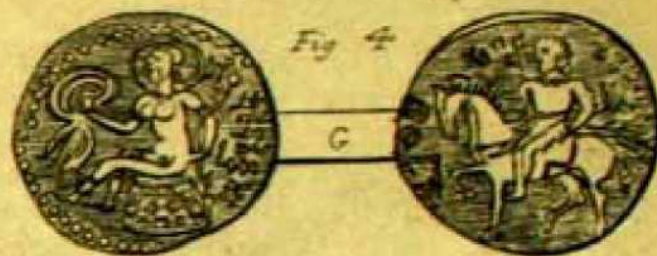
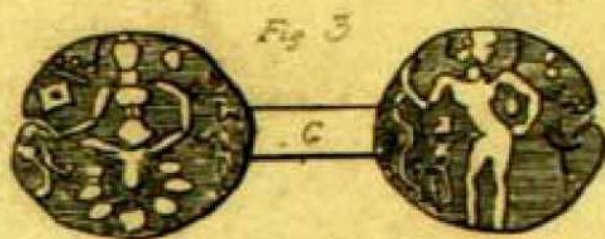
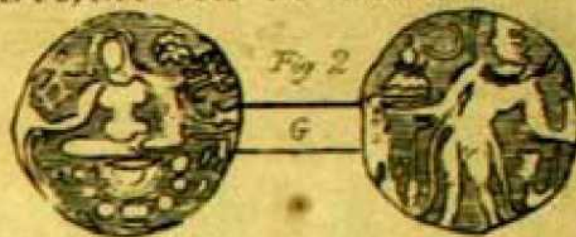
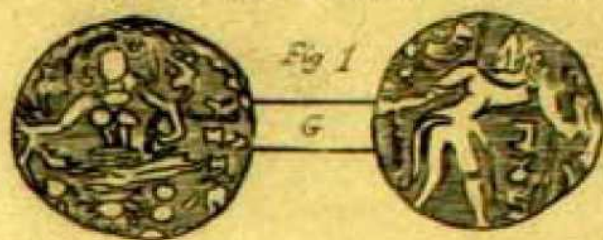


Fig 10

G

Fig 12

S



Fig 11

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## KUMARA GUPTA.

C 1	Grains 124½. Raja shooting an arrow into a Lion's extended jaws; legend 𑀘 for "Kumara;" other inscription imperfect.	Female bent to the right, holding her right hand to a Peacock; in left hand holds a lotus; emblem 𑀘. She stands apparently on a snake: legend 𑀘   𑀘𑀙𑀚𑀛; "Kumara Gupta adhiraj." 𑀘𑀙𑀚𑀛𑀜𑀝𑀞𑀟𑀠𑀡𑀢𑀣𑀤𑀥𑀦𑀧𑀨𑀩𑀪𑀫𑀬𑀭𑀮𑀯𑀰𑀱𑀲𑀳𑀴𑀵𑀶𑀷𑀸𑀹𑀺𑀻𑀼𑀽𑀾𑀿𑁀𑁁𑁂𑁃𑁄𑁅𑁆𑁇𑁈𑁉𑁊𑁋𑁌𑁍𑁎𑁏𑁐𑁑𑁒𑁓𑁔𑁕𑁖𑁗𑁘𑁙𑁚𑁛𑁜𑁝𑁞𑁟𑁠𑁡𑁢𑁣𑁤𑁥𑁦𑁧𑁨𑁩𑁪𑁫𑁬𑁭𑁮𑁯𑁰𑁱𑁲𑁳𑁴𑁵𑁶𑁷𑁸𑁹𑁺𑁻𑁼𑁽𑁾𑁿𑂀𑂁𑂂𑂃𑂄𑂅𑂆𑂇𑂈𑂉𑂊𑂋𑂌𑂍𑂎𑂏𑂐𑂑𑂒𑂓𑂔𑂕𑂖𑂗𑂘𑂙𑂚𑂛𑂜𑂝𑂞𑂟𑂠𑂡𑂢𑂣𑂤𑂥𑂦𑂧𑂨𑂩𑂪𑂫𑂬𑂭𑂮𑂯𑂰𑂱𑂲𑂳𑂴𑂵𑂶𑂷𑂸𑂺𑂹𑂻𑂼𑂽𑂾𑂿𑃀𑃁𑃂𑃃𑃄𑃅𑃆𑃇𑃈𑃉𑃊𑃋𑃌𑃍𑃎𑃏𑃐𑃑𑃒𑃓𑃔𑃕𑃖𑃗𑃘𑃙𑃚𑃛𑃜𑃝𑃞𑃟𑃠𑃡𑃢𑃣𑃤𑃥𑃦𑃧𑃨𑃩𑃪𑃫𑃬𑃭𑃮𑃯𑃰𑃱𑃲𑃳𑃴𑃵𑃶𑃷𑃸𑃹𑃺𑃻𑃼𑃽𑃾𑃿𑄀𑄁𑄂𑄃𑄄𑄅𑄆𑄇𑄈𑄉𑄊𑄋𑄌𑄍𑄎𑄏𑄐𑄑𑄒𑄓𑄔𑄕𑄖𑄗𑄘𑄙𑄚𑄛𑄜𑄝𑄞𑄟𑄠𑄡𑄢𑄣𑄤𑄥𑄦𑄧𑄨𑄩𑄪𑄫𑄬𑄭𑄮𑄯𑄰𑄱𑄲𑄳𑄴𑄵𑄶𑄷𑄸𑄹𑄺𑄻𑄼𑄽𑄾𑄿𑅀𑅁𑅂𑅃𑅄𑅅𑅆𑅇𑅈𑅉𑅊𑅋𑅌𑅍𑅎𑅏𑅐𑅑𑅒𑅓𑅔𑅕𑅖𑅗𑅘𑅙𑅚𑅛𑅜𑅝𑅞𑅟𑅠𑅡𑅢𑅣𑅤𑅥𑅦𑅧𑅨𑅩𑅪𑅫𑅬𑅭𑅮𑅯𑅰𑅱𑅲𑅳𑅴𑅵𑅶𑅷𑅸𑅹𑅺𑅻𑅼𑅽𑅾𑅿𑆀𑆁𑆂𑆃𑆄𑆅𑆆𑆇𑆈𑆉𑆊𑆋𑆌𑆍𑆎𑆏𑆐𑆑𑆒𑆓𑆔𑆕𑆖𑆗𑆘𑆙𑆚𑆛𑆜𑆝𑆞𑆟𑆠𑆡𑆢𑆣𑆤𑆥𑆦𑆧𑆨𑆩𑆪𑆫𑆬𑆭𑆮𑆯𑆰𑆱𑆲𑆳𑆴𑆵𑆶𑆷𑆸𑆹𑆺𑆻𑆼𑆽𑆾𑆿𑇀𑇁𑇂𑇃𑇄𑇅𑇆𑇇𑇈𑇉𑇊𑇋𑇌𑇍𑇎𑇏𑇐𑇑𑇒𑇓𑇔𑇕𑇖𑇗𑇘𑇙𑇚𑇛𑇜𑇝𑇞𑇟𑇠𑇡𑇢𑇣𑇤𑇥𑇦𑇧𑇨𑇩𑇪𑇫𑇬𑇭𑇮𑇯𑇰𑇱𑇲𑇳𑇴𑇵𑇶𑇷𑇸𑇹𑇺𑇻𑇼𑇽𑇾𑇿𑈀𑈁𑈂𑈃𑈄𑈅𑈆𑈇𑈈𑈉𑈊𑈋𑈌𑈍𑈎𑈏𑈐𑈑𑈒𑈓𑈔𑈕𑈖𑈗𑈘𑈙𑈚𑈛𑈜𑈝𑈞𑈟𑈠𑈡𑈢𑈣𑈤𑈥𑈦𑈧𑈨𑈩𑈪𑈫𑈬𑈭𑈮𑈯𑈰𑈱𑈲𑈳𑈴𑈶𑈵𑈷𑈸𑈹𑈺𑈻𑈼𑈽𑈾𑈿𑉀𑉁𑉂𑉃𑉄𑉅𑉆𑉇𑉈𑉉𑉊𑉋𑉌𑉍𑉎𑉏𑉐𑉑𑉒𑉓𑉔𑉕𑉖𑉗𑉘𑉙𑉚𑉛𑉜𑉝𑉞𑉟𑉠𑉡𑉢𑉣𑉤𑉥𑉦𑉧𑉨𑉩𑉪𑉫𑉬𑉭𑉮𑉯𑉰𑉱𑉲𑉳𑉴𑉵𑉶𑉷𑉸𑉹𑉺𑉻𑉼𑉽𑉾𑉿𑊀𑊁𑊂𑊃𑊄𑊅𑊆𑊇𑊈𑊉𑊊𑊋𑊌𑊍𑊎𑊏𑊐𑊑𑊒𑊓𑊔𑊕𑊖𑊗𑊘𑊙𑊚𑊛𑊜𑊝𑊞𑊟𑊠𑊡𑊢𑊣𑊤𑊥𑊦𑊧𑊨𑊩𑊪𑊫𑊬𑊭𑊮𑊯𑊰𑊱𑊲𑊳𑊴𑊵𑊶𑊷𑊸𑊹𑊺𑊻𑊼𑊽𑊾𑊿𑋀𑋁𑋂𑋃𑋄𑋅𑋆𑋇𑋈𑋉𑋊𑋋𑋌𑋍𑋎𑋏𑋐𑋑𑋒𑋓𑋔𑋕𑋖𑋗𑋘𑋙𑋚𑋛𑋜𑋝𑋞𑋟𑋠𑋡𑋢𑋣𑋤𑋥𑋦𑋧𑋨𑋩𑋪𑋫𑋬𑋭𑋮𑋯𑋰𑋱𑋲𑋳𑋴𑋵𑋶𑋷𑋸𑋹𑋺𑋻𑋼𑋽𑋾𑋿𑌀𑌁𑌂𑌃𑌄𑌅𑌆𑌇𑌈𑌉𑌊𑌋𑌌𑌍𑌎𑌏𑌐𑌑𑌒𑌓𑌔𑌕𑌖𑌗𑌘𑌙𑌚𑌛𑌜𑌝𑌞𑌟𑌠𑌡𑌢𑌣𑌤𑌥𑌦𑌧𑌨𑌩𑌪𑌫𑌬𑌭𑌮𑌯𑌰𑌱𑌲𑌳𑌴𑌵𑌶𑌷𑌸𑌹𑌺𑌻𑌼𑌽𑌾𑌿𑍀𑍁𑍂𑍃𑍄𑍅𑍆𑍇𑍈𑍉𑍊𑍋𑍌𑍍𑍎𑍏𑍐𑍑𑍒𑍓𑍔𑍕𑍖𑍗𑍘𑍙𑍚𑍛𑍜𑍝𑍞𑍟𑍠𑍡𑍢𑍣𑍤𑍥𑍦𑍧𑍨𑍩𑍪𑍫𑍬𑍭𑍮𑍯𑍰𑍱𑍲𑍳𑍴𑍵𑍶𑍷𑍸𑍹𑍺𑍻𑍼𑍽𑍾𑍿𑎀𑎁𑎂𑎃𑎄𑎅𑎆𑎇𑎈𑎉𑎊𑎋𑎌𑎍𑎎𑎏𑎐𑎑𑎒𑎓𑎔𑎕𑎖𑎗𑎘𑎙𑎚𑎛𑎜𑎝𑎞𑎟𑎠𑎡𑎢𑎣𑎤𑎥𑎦𑎧𑎨𑎩𑎪𑎫𑎬𑎭𑎮𑎯𑎰𑎱𑎲𑎳𑎴𑎵𑎶𑎷𑎸𑎹𑎺𑎻𑎼𑎽𑎾𑎿𑏀𑏁𑏂𑏃𑏄𑏅𑏆𑏇𑏈𑏉𑏊𑏋𑏌𑏍𑏎𑏏𑏐𑏑𑏒𑏓𑏔𑏕𑏖𑏗𑏘𑏙𑏚𑏛𑏜𑏝𑏞𑏟𑏠𑏡𑏢𑏣𑏤𑏥𑏦𑏧𑏨𑏩𑏪𑏫𑏬𑏭𑏮𑏯𑏰𑏱𑏲𑏳𑏴𑏵𑏶𑏷𑏸𑏹𑏺𑏻𑏼𑏽𑏾𑏿𑐀𑐁𑐂𑐃𑐄𑐅𑐆𑐇𑐈𑐉𑐊𑐋𑐌𑐍𑐎𑐏𑐐𑐑𑐒𑐓𑐔𑐕𑐖𑐗𑐘𑐙𑐚𑐛𑐜𑐝𑐞𑐟𑐠𑐡𑐢𑐣𑐤𑐥𑐦𑐧𑐨𑐩𑐪𑐫𑐬𑐭𑐮𑐯𑐰𑐱𑐲𑐳𑐴𑐵𑐶𑐷𑐸𑐹𑐺𑐻𑐼𑐽𑐾𑐿𑑀𑑁𑑂𑑃𑑄𑑅𑑆𑑇𑑈𑑉𑑊𑑋𑑌𑑍𑑎𑑏𑑐𑑑𑑒𑑓𑑔𑑕𑑖𑑗𑑘𑑙𑑚𑑛𑑜𑑝𑑞𑑟𑑠𑑡𑑢𑑣𑑤𑑥𑑦𑑧𑑨𑑩𑑪𑑫𑑬𑑭𑑮𑑯𑑰𑑱𑑲𑑳𑑴𑑵𑑶𑑷𑑸𑑹𑑺𑑻𑑼𑑽𑑾𑑿𑒀𑒁𑒂𑒃𑒄𑒅𑒆𑒇𑒈𑒉𑒊𑒋𑒌𑒍𑒎𑒏𑒐𑒑𑒒𑒓𑒔𑒕𑒖𑒗𑒘𑒙𑒚𑒛𑒜𑒝𑒞𑒟𑒠𑒡𑒢𑒣𑒤𑒥𑒦𑒧𑒨𑒩𑒪𑒫𑒬𑒭𑒮𑒯𑒰𑒱𑒲𑒳𑒴𑒵𑒶𑒷𑒸𑒻𑒻𑒼𑒽𑒾𑒿𑓀𑓁𑓃𑓂𑓄𑓅𑓆𑓇𑓈𑓉𑓊𑓋𑓌𑓍𑓎𑓏𑓐𑓑𑓒𑓓𑓔𑓕𑓖𑓗𑓘𑓙𑓚𑓛𑓜𑓝𑓞𑓟𑓠𑓡𑓢𑓣𑓤𑓥𑓦𑓧𑓨𑓩𑓪𑓫𑓬𑓭𑓮𑓯𑓰𑓱𑓲𑓳𑓴𑓵𑓶𑓷𑓸𑓹𑓺𑓻𑓼𑓽𑓾𑓿𑔀𑔁𑔂𑔃𑔄𑔅𑔆𑔇𑔈𑔉𑔊𑔋𑔌𑔍𑔎𑔏𑔐𑔑𑔒𑔓𑔔𑔕𑔖𑔗𑔘𑔙𑔚𑔛𑔜𑔝𑔞𑔟𑔠𑔡𑔢𑔣𑔤𑔥𑔦𑔧𑔨𑔩𑔪𑔫𑔬𑔭𑔮𑔯𑔰𑔱𑔲𑔳𑔴𑔵𑔶𑔷𑔸𑔹𑔺𑔻𑔼𑔽𑔾𑔿𑕀𑕁𑕂𑕃𑕄𑕅𑕆𑕇𑕈𑕉𑕊𑕋𑕌𑕍𑕎𑕏𑕐𑕑𑕒𑕓𑕔𑕕𑕖𑕗𑕘𑕙𑕚𑕛𑕜𑕝𑕞𑕟𑕠𑕡𑕢𑕣𑕤𑕥𑕦𑕧𑕨𑕩𑕪𑕫𑕬𑕭𑕮𑕯𑕰𑕱𑕲𑕳𑕴𑕵𑕶𑕷𑕸𑕹𑕺𑕻𑕼𑕽𑕾𑕿𑖀𑖁𑖂𑖃𑖄𑖅𑖆𑖇𑖈𑖉𑖊𑖋𑖌𑖍𑖎𑖏𑖐𑖑𑖒𑖓𑖔𑖕𑖖𑖗𑖘𑖙𑖚𑖛𑖜𑖝𑖞𑖟𑖠𑖡𑖢𑖣𑖤𑖥𑖦𑖧𑖨𑖩𑖪𑖫𑖬𑖭𑖮𑖯𑖰𑖱𑖲𑖳𑖴𑖵𑖶𑖷𑖸𑖹𑖺𑖻𑖼𑖽𑖾𑗀𑖿𑗁𑗂𑗃𑗄𑗅𑗆𑗇𑗈𑗉𑗊𑗋𑗌𑗍𑗎𑗏𑗐𑗑𑗒𑗓𑗔𑗕𑗖𑗗𑗘𑗙𑗚𑗛𑗜𑗝𑗞𑗟𑗠𑗡𑗢𑗣𑗤𑗥𑗦𑗧𑗨𑗩𑗪𑗫𑗬𑗭𑗮𑗯𑗰𑗱𑗲𑗳𑗴𑗵𑗶𑗷𑗸𑗹𑗺𑗻𑗼𑗽𑗾𑗿𑘀𑘁𑘂𑘃𑘄𑘅𑘆𑘇𑘈𑘉𑘊𑘋𑘌𑘍𑘎𑘏𑘐𑘑𑘒𑘓𑘔𑘕𑘖𑘗𑘘𑘙𑘚𑘛𑘜𑘝𑘞𑘟𑘠𑘡𑘢𑘣𑘤𑘥𑘦𑘧𑘨𑘩𑘪𑘫𑘬𑘭𑘮𑘯𑘰𑘱𑘲𑘳𑘴𑘵𑘶𑘷𑘸𑘹𑘺𑘻𑘼𑘽𑘾𑘿𑙀𑙁𑙂𑙃𑙄𑙅𑙆𑙇𑙈𑙉𑙊𑙋𑙌𑙍𑙎𑙏𑙐𑙑𑙒𑙓𑙔𑙕𑙖𑙗𑙘𑙙𑙚𑙛𑙜𑙝𑙞𑙟𑙠𑙡𑙢𑙣𑙤𑙥𑙦𑙧𑙨𑙩𑙪𑙫𑙬𑙭𑙮𑙯𑙰𑙱𑙲𑙳𑙴𑙵𑙶𑙷𑙸𑙹𑙺𑙻𑙼𑙽𑙾𑙿𑚀𑚁𑚂𑚃𑚄𑚅𑚆𑚇𑚈𑚉𑚊𑚋𑚌𑚍𑚎𑚏𑚐𑚑𑚒𑚓𑚔𑚕𑚖𑚗𑚘𑚙𑚚𑚛𑚜𑚝𑚞𑚟𑚠𑚡𑚢𑚣𑚤𑚥𑚦𑚧𑚨𑚩𑚪𑚫𑚬𑚭𑚮𑚯𑚰𑚱𑚲𑚳𑚴𑚵𑚷𑚶𑚸𑚹𑚺𑚻𑚼𑚽𑚾𑚿𑛀𑛁𑛂𑛃𑛄𑛅𑛆𑛇𑛈𑛉𑛊𑛋𑛌𑛍𑛎𑛏𑛐𑛑𑛒𑛓𑛔𑛕𑛖𑛗𑛘𑛙𑛚𑛛𑛜𑛝𑛞𑛟𑛠𑛡𑛢𑛣𑛤𑛥𑛦𑛧𑛨𑛩𑛪𑛫𑛬𑛭𑛮𑛯𑛰𑛱𑛲𑛳𑛴𑛵𑛶𑛷𑛸𑛹𑛺𑛻𑛼𑛽𑛾𑛿𑜀𑜁𑜂𑜃𑜄𑜅𑜆𑜇𑜈𑜉𑜊𑜋𑜌𑜍𑜎𑜏𑜐𑜑𑜒𑜓𑜔𑜕𑜖𑜗𑜘𑜙𑜚𑜛𑜜𑜝𑜞𑜟𑜠𑜡𑜢𑜣𑜤𑜥𑜦𑜧𑜨𑜩𑜪𑜫𑜬𑜭𑜮𑜯𑜰𑜱𑜲𑜳𑜴𑜵𑜶𑜷𑜸𑜹𑜺𑜻𑜼𑜽𑜾𑜿𑝀𑝁𑝂𑝃𑝄𑝅𑝆𑝇𑝈𑝉𑝊𑝋𑝌𑝍𑝎𑝏𑝐𑝑𑝒𑝓𑝔𑝕𑝖𑝗𑝘𑝙𑝚𑝛𑝜𑝝𑝞𑝟𑝠𑝡𑝢𑝣𑝤𑝥𑝦𑝧𑝨𑝩𑝪𑝫𑝬𑝭𑝮𑝯𑝰𑝱𑝲𑝳𑝴𑝵𑝶𑝷𑝸𑝹𑝺𑝻𑝼𑝽𑝾𑝿𑞀𑞁𑞂𑞃𑞄𑞅𑞆𑞇𑞈𑞉𑞊𑞋𑞌𑞍𑞎𑞏𑞐𑞑𑞒𑞓𑞔𑞕𑞖𑞗𑞘𑞙𑞚𑞛𑞜𑞝𑞞𑞟𑞠𑞡𑞢𑞣𑞤𑞥𑞦𑞧𑞨𑞩𑞪𑞫𑞬𑞭𑞮𑞯𑞰𑞱𑞲𑞳𑞴𑞵𑞶𑞷𑞸𑞹𑞺𑞻𑞼𑞽𑞾𑞿𑟀𑟁𑟂𑟃𑟄𑟅𑟆𑟇𑟈𑟉𑟊𑟋𑟌𑟍𑟎𑟏𑟐𑟑𑟒𑟓𑟔𑟕𑟖𑟗𑟘𑟙𑟚𑟛𑟜𑟝𑟞𑟟𑟠𑟡𑟢𑟣𑟤𑟥𑟦𑟧𑟨𑟩𑟪𑟫𑟬𑟭𑟮𑟯𑟰𑟱𑟲𑟳𑟴𑟵𑟶𑟷𑟸𑟹𑟺𑟻𑟼𑟽𑟾𑟿𑠀𑠁𑠂𑠃𑠄𑠅𑠆𑠇𑠈𑠉𑠊𑠋𑠌𑠍𑠎𑠏𑠐𑠑𑠒𑠓𑠔𑠕𑠖𑠗𑠘𑠙𑠚𑠛𑠜𑠝𑠞𑠟𑠠𑠡𑠢𑠣𑠤𑠥𑠦𑠧𑠨𑠩𑠪𑠫𑠬𑠭𑠮𑠯𑠰𑠱𑠲𑠳𑠴𑠵𑠶𑠷𑠸𑠺𑠹𑠻𑠼𑠽𑠾𑠿𑡀𑡁𑡂𑡃𑡄𑡅𑡆𑡇𑡈𑡉𑡊𑡋𑡌𑡍𑡎𑡏𑡐𑡑𑡒𑡓𑡔𑡕𑡖𑡗𑡘𑡙𑡚𑡛𑡜𑡝𑡞𑡟𑡠𑡡𑡢𑡣𑡤𑡥𑡦𑡧𑡨𑡩𑡪𑡫𑡬𑡭𑡮𑡯𑡰𑡱𑡲𑡳𑡴𑡵𑡶𑡷𑡸𑡹𑡺𑡻𑡼𑡽𑡾𑡿𑢀𑢁𑢂𑢃𑢄𑢅𑢆𑢇𑢈𑢉𑢊𑢋𑢌𑢍𑢎𑢏𑢐𑢑𑢒𑢓𑢔𑢕𑢖𑢗𑢘𑢙𑢚𑢛𑢜𑢝𑢞𑢟𑢠𑢡𑢢𑢣𑢤𑢥𑢦𑢧𑢨𑢩𑢪𑢫𑢬𑢭𑢮𑢯𑢰𑢱𑢲𑢳𑢴𑢵𑢶𑢷𑢸𑢹𑢺𑢻𑢼𑢽𑢾𑢿𑣀𑣁𑣂𑣃𑣄𑣅𑣆𑣇𑣈𑣉𑣊𑣋𑣌𑣍𑣎𑣏𑣐𑣑𑣒𑣓𑣔𑣕𑣖𑣗𑣘𑣙𑣚𑣛𑣜𑣝𑣞𑣟𑣠𑣡𑣢𑣣𑣤𑣥𑣦𑣧𑣨𑣩𑣪𑣫𑣬𑣭𑣮𑣯𑣰𑣱𑣲𑣳𑣴𑣵𑣶𑣷𑣸𑣹𑣺𑣻𑣼𑣽𑣾𑣿𑤀𑤁𑤂𑤃𑤄𑤅𑤆𑤇𑤈𑤉𑤊𑤋𑤌𑤍𑤎𑤏𑤐𑤑𑤒𑤓𑤔𑤕𑤖𑤗𑤘𑤙𑤚𑤛𑤜𑤝𑤞𑤟𑤠𑤡𑤢𑤣𑤤𑤥𑤦𑤧𑤨𑤩𑤪𑤫𑤬𑤭𑤮𑤯𑤰𑤱𑤲𑤳𑤴𑤵𑤶𑤷𑤸𑤹𑤺𑤻𑤼𑤽𑤾𑤿𑥀𑥁𑥂𑥃𑥄𑥅𑥆𑥇𑥈𑥉𑥊𑥋𑥌𑥍𑥎𑥏𑥐𑥑𑥒𑥓𑥔𑥕𑥖𑥗𑥘𑥙𑥚𑥛𑥜𑥝𑥞𑥟𑥠𑥡𑥢𑥣𑥤𑥥𑥦𑥧𑥨𑥩𑥪𑥫𑥬𑥭𑥮𑥯𑥰𑥱𑥲𑥳𑥴𑥵𑥶𑥷𑥸𑥹𑥺𑥻𑥼𑥽𑥾𑥿𑦀𑦁𑦂𑦃𑦄𑦅𑦆𑦇𑦈𑦉𑦊𑦋𑦌𑦍𑦎𑦏𑦐𑦑𑦒𑦓𑦔𑦕𑦖𑦗𑦘𑦙𑦚𑦛𑦜𑦝𑦞𑦟𑦠𑦡𑦢𑦣𑦤𑦥𑦦𑦧𑦨𑦩𑦪𑦫𑦬𑦭𑦮𑦯𑦰𑦱𑦲𑦳𑦴𑦵𑦶𑦷𑦸𑦹𑦺𑦻𑦼𑦽𑦾𑦿𑧀𑧁𑧂𑧃𑧄𑧅𑧆𑧇𑧈𑧉𑧊𑧋𑧌𑧍𑧎𑧏𑧐𑧑𑧒𑧓𑧔𑧕𑧖𑧗𑧘𑧙𑧚𑧛𑧜𑧝𑧞𑧟𑧠𑧡𑧢𑧣𑧤𑧥𑧦𑧧𑧨𑧩𑧪𑧫𑧬𑧭𑧮𑧯𑧰𑧱𑧲𑧳𑧴𑧵𑧶𑧷𑧸𑧹𑧺𑧻𑧼𑧽𑧾𑧿𑨀𑨁𑨂𑨃𑨄𑨅𑨆𑨇𑨈𑨉𑨊𑨋𑨌𑨍𑨎𑨏𑨐𑨑𑨒𑨓𑨔𑨕𑨖𑨗𑨘𑨙𑨚𑨛𑨜𑨝𑨞𑨟𑨠𑨡𑨢𑨣𑨤𑨥𑨦𑨧𑨨𑨩𑨪𑨫𑨬𑨭𑨮𑨯𑨰𑨱𑨲𑨳𑨴𑨵𑨶𑨷𑨸𑨹𑨺𑨻𑨼𑨽𑨾𑨿𑩀𑩁𑩂𑩃𑩄𑩅𑩆𑩇𑩈𑩉𑩊𑩋𑩌𑩍𑩎𑩏𑩐𑩑𑩒𑩓𑩔𑩕𑩖𑩗𑩘𑩙𑩚𑩛𑩜𑩝𑩞𑩟𑩠𑩡𑩢𑩣𑩤𑩥𑩦𑩧𑩨𑩩𑩪𑩫𑩬𑩭𑩮𑩯𑩰𑩱𑩲𑩳𑩴𑩵𑩶𑩷𑩸𑩹𑩺𑩻𑩼𑩽𑩾𑩿𑪀𑪁𑪂𑪃𑪄𑪅𑪆𑪇𑪈𑪉𑪊𑪋𑪌𑪍𑪎𑪏𑪐𑪑𑪒𑪓𑪔𑪕𑪖𑪗𑪘𑪙𑪚𑪛𑪜𑪝𑪞𑪟𑪠𑪡𑪢𑪣𑪤𑪥𑪦𑪧𑪨𑪩𑪪𑪫𑪬𑪭𑪮𑪯𑪰𑪱𑪲𑪳𑪴𑪵𑪶𑪷𑪸𑪹𑪺𑪻𑪼𑪽𑪾𑪿𑫀𑫁𑫂𑫃𑫄𑫅𑫆𑫇𑫈𑫉𑫊𑫋𑫌𑫍𑫎𑫏𑫐𑫑𑫒𑫓𑫔𑫕𑫖𑫗𑫘𑫙𑫚𑫛𑫜𑫝𑫞𑫟𑫠𑫡𑫢𑫣𑫤𑫥𑫦𑫧𑫨𑫩𑫪𑫫𑫬𑫭𑫮𑫯𑫰𑫱𑫲𑫳𑫴𑫵𑫶𑫷𑫸𑫹𑫺𑫻𑫼𑫽𑫾𑫿𑬀𑬁𑬂𑬃𑬄𑬅𑬆𑬇𑬈𑬉𑬊𑬋𑬌𑬍𑬎𑬏𑬐𑬑𑬒𑬓𑬔𑬕𑬖𑬗𑬘𑬙𑬚𑬛𑬜𑬝𑬞𑬟𑬠𑬡𑬢𑬣𑬤𑬥𑬦𑬧𑬨𑬩𑬪𑬫𑬬𑬭𑬮𑬯𑬰𑬱𑬲𑬳𑬴𑬵𑬶𑬷𑬸𑬹𑬺𑬻𑬼𑬽𑬾𑬿𑭀𑭁𑭂𑭃𑭄𑭅𑭆𑭇𑭈𑭉𑭊𑭋𑭌𑭍𑭎𑭏𑭐𑭑𑭒𑭓𑭔𑭕𑭖𑭗𑭘𑭙𑭚𑭛𑭜𑭝𑭞𑭟𑭠𑭡𑭢𑭣𑭤𑭥𑭦𑭧𑭨𑭩𑭪𑭫𑭬𑭭𑭮𑭯𑭰𑭱𑭲𑭳𑭴𑭵𑭶𑭷𑭸𑭹𑭺𑭻𑭼𑭽𑭾𑭿𑮀𑮁𑮂𑮃𑮄𑮅𑮆𑮇𑮈𑮉𑮊𑮋𑮌𑮍𑮎𑮏𑮐𑮑𑮒𑮓𑮔𑮕𑮖𑮗𑮘𑮙𑮚𑮛𑮜𑮝𑮞𑮟𑮠𑮡𑮢𑮣𑮤𑮥𑮦𑮧𑮨𑮩𑮪𑮫𑮬𑮭𑮮𑮯𑮰𑮱𑮲𑮳𑮴𑮵𑮶𑮷𑮸𑮹𑮺𑮻𑮼𑮽𑮾𑮿𑯀𑯁𑯂𑯃𑯄𑯅𑯆𑯇
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No.	Weight and quality.	Obverse.	Description.	Reverse.	Remark.
KUMARA GUPTA.					
5	Grains 124½.	Raja on horse-back turned to right; the letter $\mp$ over the horse's head; other legend illegible.	Female seated on a stool, right hand and finger uplifted, in left hand holds a lotus flower, has a halo round her head, but no emblem; legend apparently "Ajeet Mahendra."		This coin is much worn. (Plate xii. fig. 8.)
SKAND GUPTA.					
1	Grains 129¼.	Raja turned to right, halo round his head, Peacock Standard, in left hand a bow; vertically under left arm is $\text{N} + \text{३}$ "Skand" for "Skand Gupta."	Female seated on Conch shell throne, holding a noose in the right, and a lotus in the left hand; legend Sri Skanda Gupta $\text{६} \text{४} \text{३} \text{३} \text{३}$ ; halo round the head, and hair curled in a curious fashion; emblem $\text{४} \text{३}$ .		The legend of this coin is quite clear on both faces.
2	Grains 129¼.	Same as the foregoing, very perfect.	Same as the foregoing, legend very clear: emblem same as above $\text{३} \text{३}$ .		A good specimen, gold indifferent.



[illegible]



## Descriptive Catalogue of Ancient Gold Coins found at Bhursur.—(Continued.)

No	Weight and quality.	Obverse.	Description.	Reverse.	Remarks.
1	Grains 146.	Raja on horse-back turned to left, Peacock Standard, over horse's head, the letter $\text{ॐ}$ beneath the horse; inscription illegible.	SRI PRAKASA?	Female seated on Conch shell throne, holding a noose in right hand; emblem $\text{ॐ}$ ; legend not distinct; apparently $\text{ॐ}$ "Sri Prakasa?"	The gold of these two coins is richer than the others, but the workmanship is inferior and denotes a more modern date than the other coins. (Plate xii. fig. 9.)
2	Grains 145.	Duplicate of the above, legend less distinct.	Duplicate of the above, legend less distinct.		
A 1	126	Duplicate of No. 1, A, for Chandra Gupta, inscription not clear.	Reverse as in parallel specimen referred to.		This spare set is that alluded to as desirable for our College Museum.
A 2	130	Ditto No. 2, A, ditto ditto.	Ditto ditto	ditto	
A 3	126	Ditto No. 3, A, ditto ditto.	Ditto ditto	ditto	
B 1	114	Ditto No. 1, B, or Samudra Gupta ditto.	Ditto ditto	ditto	
C 1	125	Ditto No. 5, C, or Kumara Gupta ditto.	Ditto ditto	ditto	
D 1	125	Ditto No. 1, D, or Skanda Gupta ditto but doubtful.	Ditto ditto	ditto	
D 2	125	Ditto No. 1, D, ditto ditto.	Ditto ditto	ditto	
D 3	130	Ditto Nos. 1 & 3, D, ditto legend clear.	Ditto ditto	ditto	

(Signed)

M. KITTOE, Major, Archaeological Enquirer.





*Note on three ancient Coins found at Mohammadpur, in the Jessore district. By BĀBU RĀJENDRALĀL MITTRA. (Communicated by CECIL BEADON, Esq.)*

In the preceding plate (Pl. xii. figs. 10, 11, 12) I have given figures of three coins found along with several others near the Arunkhali river at Mohammadpur, in the district of Jessore, and presented to the Asiatic Society by Mr. F. L. Beaufort. It appears they had been buried in an earthen pot which was accidentally discovered by a man digging a well.\* The coins, which were found along with those now under notice, are all of the Gupta kings of Kanouj, and comprise specimens of the silver coinage of Chandra Gupta, Kumāra Gupta and Skanda Gupta. The metal of these coins is very impure, and were the fact of their coins being frequently discovered in Bengal a sufficient evidence to conclude that the Gupta kings of Kanouj once held the sovereignty of this country, it would strengthen an opinion started by James Prinsep that the provincial currency of the Guptas was of an inferior metal to what was used in their metropolitan towns.

No. 1. (Fig. 10) is a gold coin, weighing 85 grains. On the obverse it has a female with a bow, a standard, a deer looking towards the left, and a border round the margin, with the monogram श्री, *Sri* in the Gupta character. *Reverse*, a winged victory to the right, with an undeciphered Arian ? inscription in the margin.

The reverse is very unlike that of the Gupta coins, but the monogram induces me to assign it to Sri Gupta, the founder of the Gupta dynasty of Kanouj, who is the only king of that line whose coins have not yet been discovered, and this conjecture is somewhat strengthened by the fact that it is only in the coinage of the Guptas that we observe the practice of using initial letters instead of, or conjointly with, the names of the kings in full, and it might, not very unreasonably, be supposed that the founder of the dynasty was the first who introduced this practice as well as the figure of victory, which last, his successors changed into a Lakshmi.

\* Unfortunately Mr. B. has been unsuccessful in preserving any of the fragments of this pot.—Eds.



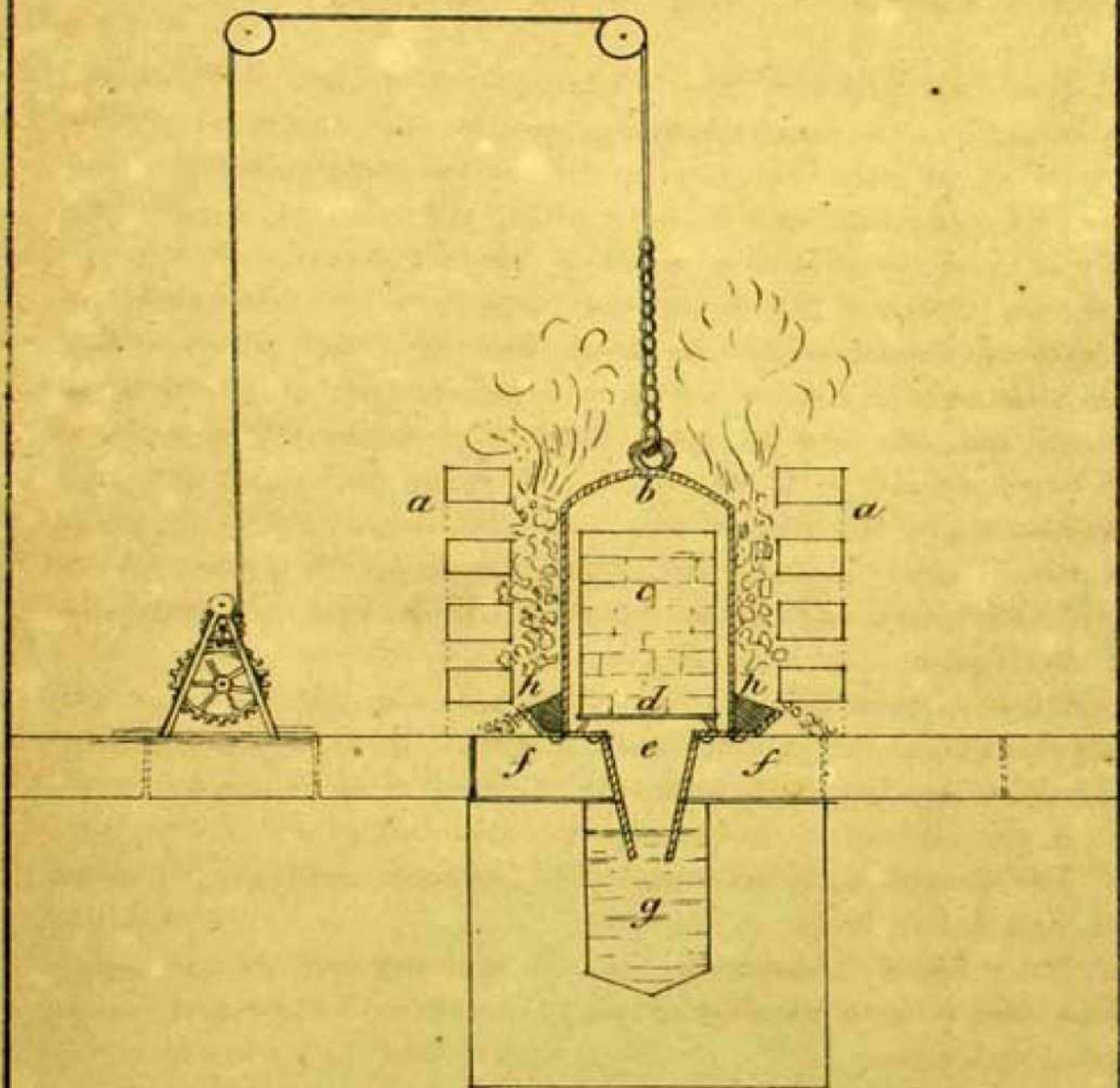
No. 2. (Fig. 11) appears likewise to be a Gupta coin, and is evidently an unique specimen of its kind. On the obverse it has the rájá seated on a stool with a nimbus round his head, and attended by two females standing by his side; above his left hand is an indistinct monogram. On the reverse is a standing female figure holding branches of lotus in her hands; before her is a peacock, and to the left the letters श्रीनरेन्द्र (गुप्त?) *Sri Narendra (Gupta ?)*, in the Gupta character. It is however doubtful if this be a coin of the monarch of that name, whose coins have an equestrian obverse.

No. 3. (Fig. 12.) This coin has not yet been noticed by any Indian numismatist. On the obverse it has a human figure seated on a bull couchant, with the letters जय (Jaya) at the bottom, and श्रीम in the margin to the left, in the Gupta character. On the reverse the legend is the same as in the Gupta coins, but rudely executed. The inscription is not perfect, the letters श्रीमत (Sri mata) are all that are distinct: Metal very impure silver.

A coin somewhat analogous to this, but with the bull rampant, was discovered by Mr. Tregear at Jaunpur whilst digging on the site of an old fort called Jayachánd's Koth (*Journal As. Soc.* Vol. iii. p. 411, plate xiii. fig. 12), and a brass seal with a bull couchant done in very much the same style as the coin, with the name of Jayachánd in full was found at Sháhpur Oonde, and presented to the Asiatic Society in June, 1850, by Mr. Earle, from a careful comparison of which, bearing in mind that the bull is the peculiar cognizance of the Rájputs, and that Rájá Jaychandra of Captain Fell's Benares copper plates (*Asiatic Researches* XV. p. 446,) was a scion of that royal stock, I am led to assign this coin to that prince. According to the plates Jayachánd flourished in A. C. 1177, an era fully borne out by the modern and peculiarly Indian appearance of the coin.



*Fig. 1.*



*Mexican Cappellina.*





*Description of a cheap and simple apparatus for distilling off the Mercury from an Amalgam of Gold or Silver—By HENRY PID-DINGTON, Curator Museum of Economic Geology.*

When explaining to the Society's meeting of the 4th of February, the beautiful Spanish amalgamation process for the extraction of Silver from poor ores, I placed on the table my own two-anna imitation of the Spanish "*Cappellina*," or bell, for distilling *per decensum*, used in the great mining works of Mexico and Peru, Major Baker remarked to me that the knowledge of this apparatus would be a fortune to the poor gold-washers of Lahore and the North West Provinces, who now lose all the mercury which they use to amalgamate their gold with after washing; and this like all petty industrial losses may amount to a much larger sum than is suspected, and being an expense added to the subsistence of the gold-washer before he obtains his profit, must often prevent poor washings from being worked. To diffuse knowledge of this kind is one of the objects of our Journal, and especially so of the Museum, and hence the present paper.\*

I will first describe the Spanish CAPPELLINA which is a large bell of Copper, gun-metal, or Iron, beneath which the amalgam is placed, and of which a section is shewn in Fig. I. Plate, as follows:—

- a. A circular wall, with openings, to support the fuel.
- b. The *Cappellina* or bell with a pulley to hoist and lower it; about 3 feet high and 18 inches in diameter.
- c. The column of amalgam which is squeezed into wedge-shaped blocks, placed so as to leave also a small channel down the centre; they are piled up upon—

\* See also Journal Vol. IV. page 279 (for 1835) Capt. Cautley on the Gold-washings of Nahun, and Vol. XVI. p. 266 Capt. Abbott, on the Gold-washings of the Beyass. At the gold-washings of the Brazils, a singular method is adopted by the poor washers to save at least a portion of their mercury. The pellet of amalgam is placed in a metal dish and covered with a few green leaves, and then being placed over a charcoal fire it is heated, and stirred by an iron rod; when the leaves are dry, they are replaced by fresh ones, and from the leaves used in the process, a considerable quantity of the mercury is said to be recovered!



- d.* An iron dish to receive them.
- e.* A copper dish with high borders and a funnel, upon which the bell fits as close down as possible, the funnel dips into the reservoir of water.
- f.* Stone to support *e*, and in which are cut channels to allow the water to circulate round the copper.
- g.* Reservoir of masonry filled with water, into which the mercury distils.
- h.* Luting round the foot of the bell to prevent the escape of the mercury.

The operation of this is easily seen from the sketch: The fire is kindled on the upper part first, and as it burns downwards the pile of amalgam heats, and all the vaporized mercury is driven downwards through the funnel into the water where it condenses. The blocks of silver are then called *Plata Piña*, or Pine-apple silver, in commerce.

My own contrivance for effecting this distillation with common bazar materials, to be obtained every where, is shewn at Fig. II. and III. ; the first being the separate pieces of the apparatus, and the second a section of it when in action.

No. 1 May be a flat tile, or a plate of thick tin, or thin sheet iron, 7 or 8 inches long, by 5 inches broad with the four corners turned down and a hole in the centre to admit the stem and bowl of—

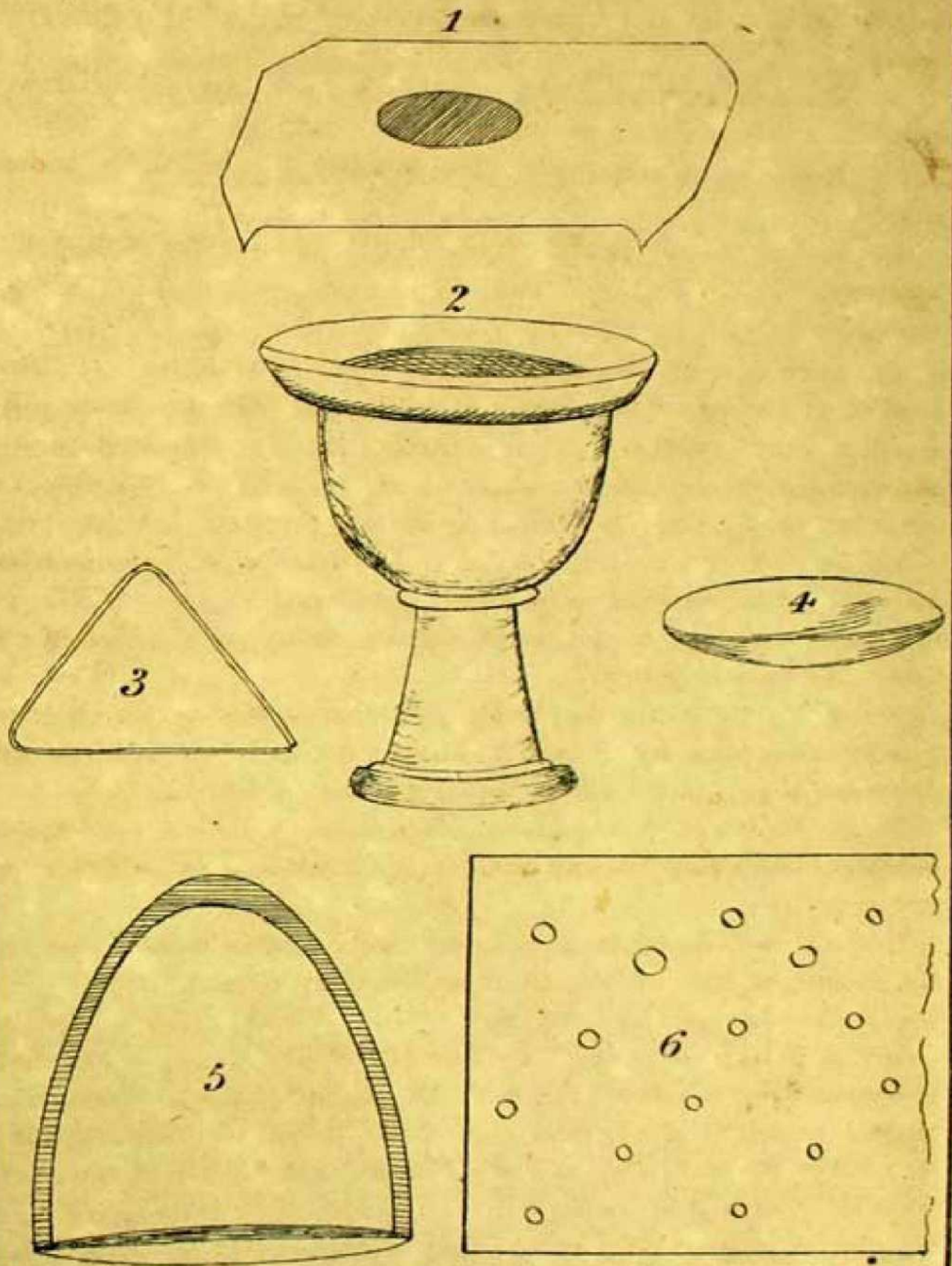
No. 2 Which is the common black varnished *Kolkee*, or tobacco-holder, of the Native hookah or Goorgoory, and is about 3 inches broad at the top.

No. 3 Is a little triangle of stout iron wire which lies easily in the bottom of the *kolkee*; three or four small lumps of clay may be put in the place of this to support—

No. 4 Which is a small circular bit of sheet iron, beaten hollow to form a dish. A small circular dish cut out of any broken globular-shaped vessel, as a common *goglet* or *garrah*, will answer, but the iron is better, because a little of the gold might sink into the earthenware dish; it will be noticed that when No. 4 is in its place there is an interval between its edge and that of the bowl of the *kolkee*, say of three or four-tenths of an inch. It is by this interval that the mercurial vapour escapes downwards, as shewn by the arrows in fig. III.



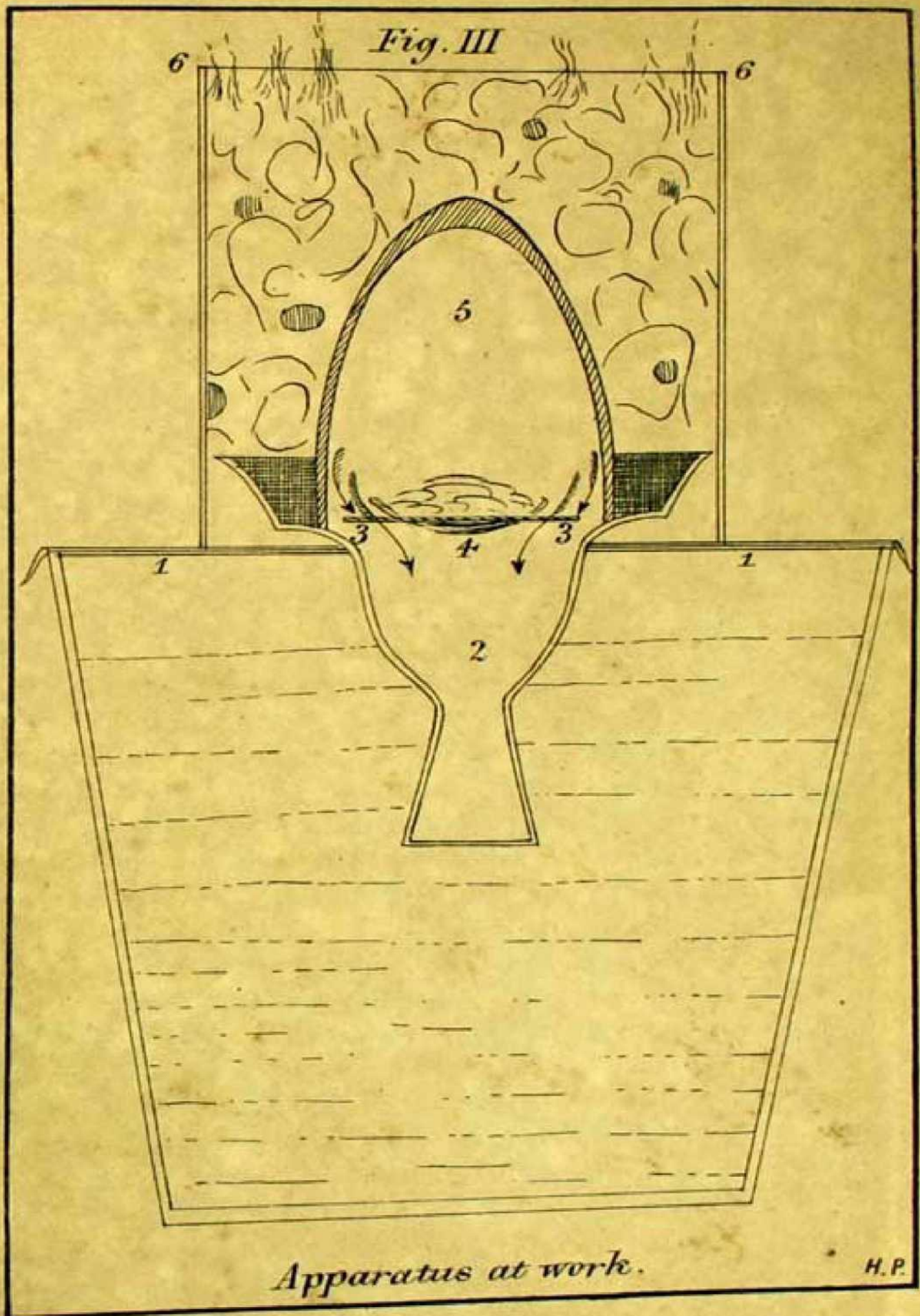
*Fig. II.*



*Parts of the Apparatus.*

H.P.







No. 5 Is a section of a common pipe-clay crucible which may be imitated in earthen-ware by any potter. It is turned mouth downwards, and should sit upon the inner rim or shoulder of the *kolkee*. It is about 2 inches in diameter at the mouth.

No. 6 Is a piece of old tin plate 9 or 10 inches long by 5 inches high, with holes in it, bent into a cylinder to contain the *guls* or charcoal used as fuel.

To use this apparatus, place the plate No. 1 over any kind of earthen vase, European or Native, such as a jug or pickle-jar or even a glass tumbler or finger glass as in Fig. III.

Put the pellet of amalgam into the dish No. 4, and place this upon No. 3, or upon the earthen supports for it, inside the *kolkee*, and then set the *kolkee* with its stem through the hole in No. 1, dipping about half or three quarters of an inch into the water with which the vase or glass should be filled.

Have some good fat clay : That which the natives mix up with cowdung to line their *chulás* with is very proper for the purpose ; and fill in the space *h* (of Fig. I.) squeezing it well in, so as to have no cracks ; this is called "luting." Fill the whole space as shewn by the shade in Fig. III. with the luting clay.

Put the tin Cylinder No. 6 over the apparatus, observing that it should just fit loosely over the edge of the *kolkee*, so as to allow of a little air rising up, but not of the fuel falling down below the *kolkee*, for our object is to drive all the mercury downwards by heat from above.

Fill the cylinder with small charcoal or broken *gools* ; and set fire to it *at the top*, so as to let it burn slowly downwards which it should do out of any draft. If the quantity of amalgam is large, lift off the cylinder when the first lot of fuel has burnt, and the whole is cold, and clear away the ashes ; and then fill it again with fuel and let it burn out as before. It will then be found on opening the apparatus, that all the mercury has distilled into the water, and that the gold remains in the iron dish, but it should be heated again in an open fire, or melted down, to drive off a little mercury, which always hangs about it as well as about silver when worked by amalgamation, even in the great Mexican establishments.



I have had occasion to show this apparatus to a gentleman who was proceeding to Australia, and I may as well add here that I explained to him that small pellets of amalgam, say as large as peas or buck-shot may be introduced into a bent gun-barrel and care being taken by turning the barrel over to send them down to the breech, this may be placed with the bend resting on a little mud wall, and the breech part nearly horizontal. If a little fire is now made round the breech the mercury will quickly distil over through the muzzle end, which should be kept cool by a wet rag and have its end dipping into any vessel of water. The pellets of gold will remain separate unless the fire is so hot as to melt them.

The apparatus above described may be imitated by any contrivance, such as the lid of an iron saucepan with the socket part of its handle, or a small pistol barrel, driven through the middle of it for a pipe, and an old pomatum pot or gallipot or china-cup coated with a little stiff clay and dung, beat up together, or a small tin funnel with the tinning scraped off and the pipe stopped up with clay would form a makeshift for the crucible or bell;\* care being always taken to close any cracks with the luting. In England I have no doubt that a capital little cast and sheet iron apparatus might be manufactured for a few shillings. No other precaution is necessary in using any of these contrivances than not to breathe any of the vapour and not to meddle with the apparatus till nearly cold, as while hot there is always some vapour ready to escape and in the great Mexican mining establishment, the workmen have been killed by the bursting of the *Campanilla*, when of a faulty casting, from breathing the mercurial fumes. A severe salivation would follow the incautious breathing of a very small quantity, and thus care should be taken to avoid it.

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\* A common house or sheep bell would be in effect a small "*Campanilla*" and this might be obtainable at the diggings.





*Diary of a Journey through Sikim to the Frontiers of Thibet.*—By  
*Dr. A. CAMPBELL, Superintendent of Darjeeling—with a Map.*  
 (Communicated by SIR JAMES COLVILE, KT.)

In 1848, I made a journey into Sikim; a Journal of my trip was published in the Journal of the Asiatic Society for May 1849. The Map which accompanied that paper, although it contained a good deal of the Geography of Sikim previously unknown, was altogether inaccurate in the Northern districts, which I had not then visited. I now give the completion of a tour of Sikim with Geographical notices of the proximate parts of Thibet, and hope that it may be acceptable.

The journey here detailed was performed in September, October, and November, 1849, in company with Dr. J. D. Hooker, R. N., who was then on a Botanical Mission from the British Government to the East Indies. Dr. Hooker having obtained the permission of the Governor-General, Lord Dalhousie, to travel in Sikim, and the Rájá of that country having agreed to facilitate his journey to the passes which divide his territory from Thibet, left Darjeeling early in the month of May in the expectation of reaching the Northern Frontier of Sikim by the end of the same month, and returning before the setting in of the heavy rains in July. He had, however, not gone more than a few marches when the most vexatious obstructions were put in the way of his advance by the local officers along the route, encouraged thereto by the Singtam Soobah, the officer appointed by the Raja's Dewan to attend upon him to facilitate his journey and his researches!\*. His plant collectors were threatened and misdirected; the people along his route were prohibited from furnishing him with supplies; attempts were made to convince him that he had reached the Thibet frontier soon after he passed Choongtam when he was 30 miles from it, and he was repeatedly told that an attack by Thibetan Troops and a tramp to Peking would be the result of his further progress. In short, every effort that bullying and falsehood could devise was made to drive him from his purpose, but ineffectually; for although he and his people were reduced to living on wild spinage and arum roots, the Sikimites

\* This man was expressly selected by the Dewan for the purpose of defeating the object in view, and to the end was his zealous co-adjutor in preventing access to the Raja and the adoption of more friendly conduct.



could not starve them, and he had determined that starvation alone should force him to a retrograde movement. He, therefore, held on till he ascertained from me where the Northern boundary of Sikim really lay, of which I had no idea when he started, and in virtue of the Rájá's permission to visit it he determined to reach it. With indomitable perseverance supported by the courage and patient endurance of his followers, he succeeded in outstarving his tormentors, for the Soobah, who had endured similar self-imposed privations, and had eaten wild spinage, arum roots, and other garbage until he nearly died of the colic, knocked under, and at last admitted that the Kangra Lama Pass was on the frontier, that he had told lies innumerable on the subject, but would now take Dr. Hooker and his men onwards in the hope of their speedy return to Darjeeling. This he did, but not until the end of July, and from that time Dr. Hooker continued to explore and botanise in the Lachen and Lachoong vallies, and up to the passes, throughout the remainder of the rains, at the conclusion of which I joined him. I am not aware that any other European has ever travelled, and lived in a small tent in the Himalaya all through the monsoon, and it is certainly a very severe trial. He had his reward however in great collections of new plants made where no European had ever trod before, in making scientific observations of the confines of Thibet at very high elevations in an unusual season of the year, and in adding much to our Geographical knowledge in that unknown quarter. It was the necessity for ascertaining the real cause of the obstructions he had met with from the Rájá's Officers that led to my journey in that direction, and indeed I was little loath to undertake it when I read Hooker's accounts of the new regions he had visited, and of his views into Thibet from the passes both of which he had resolved to revisit after the cessation of the rains for botanical and other purposes. Having obtained the permission of the President of the Council of India, laid in, and suitably packed up, two months' supplies for my own party and Dr. Hooker's, I started at the worst season of the year for travelling in Sikim,—September 23rd,—to join him at Choongtam which is at the junction of the Lachen and Lachoong rivers, and with the hope of being allowed to travel through Thibet from the Kangra Lama Pass to the Doukia Pass,\* and thence down the Lachong valley to the starting point, Choongtam. We were very fortunate in effecting these objects in the



most amicable manner. A few days' residence in Thibet and the exploration of the Lachen and Lachoong vallies of Sikim amply repaid me for the difficulty and danger of the journey which was considerable, and my companion was equally satisfied with his success in the cause of science. From Choongtam we retraced our steps to Singtam, whence we proceeded to Tumloong, the residence of the Rájá, in the hope of procuring explanation from him in person. From Tumloong we were anxious to go by the Chola Pass into the valley of Choombi, which is Thibetan territory, and to return from that valley by the Yakla Pass to Darjeeling. We crossed the Chola Pass on the 7th of November, but the Thibetan officers here were not so accommodating as those we met at Kangra Lama, and we returned on the same day to Chumneko in Sikim, where the Singtam Saobah and other adherents of the Dewan brought matters to a crisis by personal violence on both of us, their force however being mainly expended on me. The accompanying map is a reduced one from Dr. Hooker's, and exhibits our whole route. All the elevations and Meteorological observations are his also. The climates of Lachen and Lachoong much drier than that of Darjeeling, and the noble scenery in and around those Northern vallies of a totally different character to the forests of the Southerly portions of Sikim, give them additional interest as promising places of resort to invalids from Bengal. Their proximity to Thibet with which country a route for unembarrassed commerce from Darjeeling and Bengal would be a great advantage, also gives them a more general importance. Of Thibet I can in no way say that it is a land of any promise. As far as I could see, it was mountainous and rugged, bare of vegetation and barren. The province of Dingcham, which we visited has probably a mean elevation of 16,000 feet. Bhamtoo is 18,000, the valley of the Geree to the North is, say 15,000, it is utterly bare of trees, and quite barren. Dingcham extends along the Northern face of Himalaya from the Tingu Maidon on the West to Tawang, on the East an extent of 360 miles. The intense cold of the climate in the winter does not admit of its being permanently habitable by man or beast.\* It is occupied, however, by Nomadic Bhotias from May

\* On the 17th of Oct. the Ther. fell to 5° of Faht. It was fortunately for our party quite calm. When it blows hard in Thibet in the cold weather it is almost certain death to be as little protected as we were.



The trees and underwood soon shut him from my sight, but for a minute and more I heard the horrid crashing sound as he bounded along to his untimely end. The men who were behind me soon came up and slid down in search of him. It was half an hour ere they returned. When they reached him he was stone dead, lying against a large rock the blood flowing from his nostrils, and his back broken;—poor Bhotia! Nine years long you were my steady and willing steed!

Walked the last 3 miles in a hot sun but reached this at 2 P. M. Found a good house prepared for me by the Cheeboo Lama, Vakeel of the Sikim Raja who had preceded me, and met with due attention from the Raja's people. Thermometer 72° at 2 P. M., 68° at 6 P. M.

The forest around this place is now in full and varied foliage; very many trees are in flower, and the orange-blossomed Erisina makes a great shew. Just around my door are Oaks, Chesnuts in flower and fruiting, Wormwood, Hypericum, Osbeckia, Holly, Magnolia in flower, besides many handsome plants unknown to me by name.

Close below me there are fine crops of Tugmaar rice in full ear, but not ripe, and Murnea, Kodso, and Indian corn nearly ripe. The first crop of rice, the Zorug variety which is grown lower down, has been cut and stored.

*Temi, 26th September.*

Left Namgialachi at 7 A. M. and arrived here at 2 P. M. by which I reckon the distance to be 14 miles. Road very bad, and in many places ankle-deep in sticky clay, or black peaty earth. Tried a chair, which is a *tolerable* substitute for a good poney, and no more.

The Raja's people here are civil; a good house has been put at my disposal; small supplies and other assistance have been offered and accepted. The house is a Bhotia one; a notice of its style will suffice once for all on this journey. It consists of one large room 50 feet by 24, the floor raised 5 feet from the ground, well planked and supported on massive squared posts and beams. The walls are of close bamboo matting, the ceiling, of close laid straight bamboos an inch in diameter, looks very neat, it is laid on scanted cross beams 3 feet apart. The roof of bamboo thatch projects 7 feet, giving a verandah all round.

The Teesta at "Look Sampoo," is in sight from Temi the water of a very dirty greyish-green colour like soap suds. Badong, on the



opposite side, and the hills of Bootan lower down are bright with green woods, and ripening crops of rice, Indian corn and millet. This is a much better season than the cold weather, when I last travelled here in 1848, for lively and varied scenery. The Tondong Forest, stretching in one unbroken mass from its summit, an elevation of about 8000 feet above the river, to the Teesta, is a noble expanse of varied and majestic vegetation. Temi is embosomed in it, and stands about half way between the river and the summit.

Thermometer at 8 P. M. in the house 72°; elevation say 4000 feet.

*Neh-Mendong, 27th.*

Started from Temi at 6 A. M. and arrived here at 2 P. M. Distance most probably 15 miles. Heat intense and overpowering; in the Teesta valley through which the route runs, it was quite stifling from 9 to 11, and again from 1 to 2; yet there was a breeze occasionally blowing from the south, but it gave no relief. The eight Lepchas who carried my chair, in which I rode but seldom, were fairly overcome and had to bring up at the Rungoon river to refresh. The vegetation is superb all the way, and its shade frequently protected me from the scorching heat. This is the season to see these jungles in perfection although it is somewhat perilous. It is only in malarious places, and at times when malaria is rife that the mixed tropical and alpine character of the Sikim forests can be seen in all its glory. Oaks and the Pandanus palm, Chesnuts and the Oopi palm, flourish side by side along Nainfok and Bram. Scitamineous plants of various kinds, and wormwood, each of 12 feet high and more, form a common under-wood in the clearer spaces, and all the other plants are of gigantic growth. There is a species of Chesnut hereabout which I never saw before. It has a broad and round leaf with wide spreading graceful branches. The clusters of unripe and light green fruit add to its beauty. It is a very handsome tree.\*

The "Pooah Hemp," *Böhmeria nivea*, abounds along the road from the Rungpo to this place. The average elevation of the zone in which it flourishes is about 600 feet above the river. On the Rungeet I found the Pooah at 200 feet above the guard-house, i. e. at an ele-

\* The other two varieties of Chesnut which I know, are 1st, the large-timbered Chesnut at Darjeeling with small thick hard leaves, and 2nd, one with a long sharp-pointed leaf now in flower at Namchi.



vation of 1800 feet. It has a most extensive range, and the supply might be rendered unlimited, if there was a demand for it in India or in Europe. Sir William Hooker has recently informed me that he has caused a trial of its qualities to be made in London, Dr. Hooker having sent him some of the prepared Hemp from Darjeeling. Sir William instances the successful cultivation of the Indian Jute as an incentive to further trials of the Pooah.

The Jute was not many years ago unknown in England. Now £300,000 worth of it are imported annually !\*

The Peepsas are very indefatigable here, and very numerous. I am encamped at the measuring stone (see Journal of 1848) ; there is no water within a mile, but my ground is, I hope, above the level of malaria.

The road to-day swarmed with leeches, the people's feet streaming with blood, and it was so slippery in the long descent from Temi that I could not walk with shoes on, and I was obliged to move between two Lepcha supporters, whose bare feet give them a great advantage. The airs, and underwood teem with insect life ; innumerable butterflies of brilliant hues sport in the sunshine ; and thousands of other less attractive creatures are on the wing. The night is as busy a time as the day with the insect world. The roof of my tent is literally covered with the most beautiful little moths, and the air resounds with the discord proceeding from innumerable throats.

Thermometer at 8 P. M. 76°.

*Padom, below Kedong, 28th.*

Left Neh at 6 A. M. and arrived here at 3 P. M. I was anxious to reach Kedong as it is certainly beyond the limit of malaria, but I could not accomplish it ; I hope we are safe here ; it is, I reckon 5 or 600 feet above the Teesta and *said* to be healthy.

Thermometer at 5 P. M. 75°. I am pitched near a small stream of water among bamboos, high reed grass and Acacias ; there are some Oaks, however, lower down, and at the cane bridge over the Rumphup there are three large and handsome " Boreh " Palms. Pandani, Peepsas, musquitoes, and a black venomous ant abound here. My feet are swollen and sore from leech and peepsa bites ; my face and hands equally so

\* The Pooah has been very favourably reported on for cordage, by Captain Thomson of Calcutta, see Proc. Agricultural Society for 1848.



from the musquitoes and peepsas. This is a trying and fatiguing march at this season. The heat in the valley of the Teesta is quite overpowering and I never before experienced so much inconvenience from it. My head all day felt full to bursting, and my face and eyes were burning: but the skin was open at every pore, and I could walk along briskly. The Lepchas, who carried my empty chair, felt it even more than I did; they were quite exhausted, and rolled about as they walked along panting for breath. The tropical character of the route, as we approached Bamsang, was very striking. All the vegetation luxuriant, and every plant gigantic. The hum of insects was so loud as to rival the roaring of the river; both united were quite deafening.

The insect and vegetable kingdoms alone possess this region. Neither bird nor beast was to be seen. Thermometer at the Bansong ghat in a house at 1 P. M. 87°, a fine breeze blowing; but this does not relieve the feeling of oppressive and choking heat, which I have experienced in the vallies since I started.

There are many beautiful plants in flower just now between Neh and Bansong, which I never saw before. I found a "Sweet Pea," a climber, colour pale Rose, and two other Peas, one purple, a shrub, the size of the Spanish broom, the other blue, a small shrub with broad rounded leaves, also a lilac, terrestrial orchis 10 feet high called "Broong," a white one, and a blue one, each 6 feet high. There is also a handsome fig tree, with clusters of yellow fruit like Loquats, called "Suntote;" it is not edible however.

I heard from the Raja to-day in reply to my announced intention, of proceeding to his Northern frontier at Kongra Lama. He authorises Aden Cheeboo Lama to accompany me as I desired, and sends orders to his officers to clear the roads, and otherwise to assist me. The officers along the line I have come, paid no attention to the Cheeboo's previous requisition. The following is the administrative division of the country between Darjeeling and the Thibet frontier at Kongra Lama and Doukia.

1st. From the Rungeet to the Teesta, by the line of Atooknot and Temi, the country is under the Kaji who lives at Burmeok, the Meboo at Namgialachi and the Mahapun Kada, who resides near Temi.

2nd. From Temi to Neh is under the Lasso Kaji, who resides above Namfok.



3rd. From Neh to Goreh is under the Goreh Soobah, who resides at Goreh.

4th. From Goreh to Choongtam, the country is under the Singtam Soobah, who resides at Singtam.

The Choongtam Lama, and the Phipuns of the Lachen and Lachoong vallies, have respectively the local charge of their districts under the Singtam Soobah's surveillance, but the peculiar position of the two latter officers, the Phipuns, serving as they do the authorities of adjacent Thibet, as well as the Sikim Raja, will be better explained afterwards.

The Lachen man manages the country extending from Choongtam up to Kongra Lama; the Lachoong one, from the same point up to the Doukia Pass. Choongtam is at the junction of the Lachen and Lachoong rivers. Their united streams form the Teesta.

The Gereh district is at present assigned to the heir-apparent of the Rájá, the Singtam one to the Mohá Ráni.

We met many men\*to-day, travelling to the South; they had been 10 days on the road from Choombi. They were laden with salt. We passed others with loads of chopped Munjeet, going all the way to Phari.\* How pitiful to see the trade of a people, in such bulky articles, carried on in this way, when a road for Ponies and Bullocks would make it so much more easy and profitable.

The road from Bansomg to Lachen and Lachoong† is so extremely bad, that it is not used in traffic with Thibet till the one by Chola to Choombi is snowed up. Lachen and Lachoong are nearer Bansomg than Choombi; and no snowy range intervenes, but there is no food to be had in this direction. From Lachen and Lachoong northwards the roads are good for cattle into Thibet, but a cattle road from the heart of Sikim to these places is required, to establish a proper trade with Thibet. The British Government could do this; the Sikim Raja never can have the means to do so.

Talking of the wretched system of trade in this direction, and of the people who dabbled in it, the Cheeboo Lama said to me the other day, "The Bhotias are, however, very good Pedlars, (Biparies,) they eat so much less than Lepchas." "How do you mean," I asked.

\* A frontier mart of Thibet.

† The principal places in the vallies of these names.



"They eat enormously at the expense of other people, but on their own charges they will fast to faintness rather than spend a penny, and it is the same with drink; a Bhotia, although so fond of it will rarely buy it; a Lepcha if he wants it will freely give any price for it." So much for characteristic differences in these tribes.

Goreh 29th. Started from Padom at 6 A. M., reached Kedong where I encamped in 1848, at 9, and this place at  $\frac{1}{2}$  past 12. A hard march it is; the road is so slippery in many places, that I found it impossible to walk alone with shoes on, and had recourse to the support of a barefooted Lepcha. No use to-day of the chair, which we had to take to pieces in order to carry it along the cliffs of Sungdum.\* Near Goreh, to the West of the "Rungki" stream, there has been a great land slip by which the road has been quite obliterated for  $\frac{1}{4}$  of a mile, and it was a difficult matter to get along the slip, as it is almost perpendicularly scarped on this side the Rungki; however, the road is worse even than over the land slip, or along the cliffs of Sungdum; at two places there is nothing to walk on but the stem of a tree with notches cut in it, standing erect against the face of the rocks; and above one of them was a dripping rock which rendered the notches as slippery as ice, and wetted us thoroughly as we climbed them.

Last night it rained heavily; the tent of Nipal blanketing in which I slept, leaked like a fine sieve.

The rain came down in large drops, but was spurted through the tent roof like the spray of a water fall. I got one umbrella over my head in bed, and another over as many of my things as it would cover, and got up this morning pretty dry, but little refreshed. We marched this morning in heavy rain, which lasted 4 hours.

There is a fine crop of Sunkoo Rice in ear on the shoulder of Sungdum, and near the Rhododendron Arboreum I noticed at this place in December last;—elevation say 4,500 feet. Rice at Goreh cut sometime ago;—elevation probably 1,000 feet less.

The whole country to the North and South is in heavy clouds. Nothing to be seen.

The Cheeboo Lama was my companion all the morning, and his sensible and fluent talk beguiled the hours. He is a student of "Mendooling," a famous School or College in Thibet, and situated

\* See Journal of 1848.



two horse journies east of Lassa. Here he informed me he had studied the Bhuddist religion for two years, but in saying so modestly added, "It takes 3 years of Mendooling to make a Pucka Lama," of his alma mater, he gave the following particulars, "There are upwards of 100 Lamas engaged in clerical duties, and in teaching Religion. Literature and the Sciences are deeply studied and extensively taught, and all the arts of life are also taught there, carpentry, stone masonry, painting, shoemaking, tailoring, &c. Pupils come from all parts of, what we call Eastern Thibet, the province of U, to learn there;\* one professor is always appointed to the principal College at Lassa from Mendooling, and when I was there he had the sons of all the grandees of the capital, as his pupils." I expect to hear much more of Mendooling before we have finished our travels together, for the Raja writes that my little friend is to take care of me to the Northwards.

I have got into a good house for the night, 4 P. M.; heavy and continued rain. Thermometer 71°, elevation say 3,500 feet.

30th. Incessant pouring rain all night. The house leaked freely, but I got a dry spot for my bed. The rain continues, and we halt for the day. No wonder that Bengal is under water just now, every depression on the mountain sides has a snow-white foaming torrent in it, rushing furiously to the river, and they are countless in number. The noise they make, added to that of the Teesta itself which is just below me, say 2,000 feet, is like the coming of a furious storm. I felt very aguish last night, and dreaded jungle fever; but the symptoms are gone to-day. Lepchas own this house, my portion of it is curtained off, but there is only one door for us all. They have indeed some dirty habits. The grandmama of two urchins was sitting in the door way, as the place for strongest light when I got up from breakfast. The brats were busily hunting lice in her back clothes and eating them, she herself being similarly employed with those in front!

There is a little tobacco grown here, but no care is taken of it. The leaves are small, it is allowed to go to seed, and is said to be of very inferior quality.

\* All East of the Kamboola range is "U," all West of it "Chang" or tsang.



The wormwood\* on the fallow ground here is 12 feet high ; it grows up to, and all round the house and on both sides of all the pathways. I find, however, that the people have good reason for allowing this plant to monopolise all their fallow clearances. Its decayed leaves are considered to form the very best manure, it has a profuse foliage which falls and rots readily during the rains, and the plant itself is cut down after it seeds in October, and is also allowed to rot on the land.

As I did not in December last travel further than this place on the route to Thibet, I shall henceforward note more particularly the state of the road, the places along it, &c. ; the foregoing memoranda being purposely of a more general nature, or designed only to shew the differences observable in the country during the rains, and in the dry season.

October 1st. Tugvia, east bank of the Teesta. Started at 6 A. M. and reached this at 2 P. M. very much fatigued ; got into a good house just as it began to rain heavily. Thermometer at 6 P. M. 72°. Probable elevation above the Teesta 1,200 feet. There is a little garden attached to this house, the first I have seen in Sikim ; it contains plantains, sugar-cane, capsicums, turnips, two kinds of creeping beans and marigolds.

The villagers have been turned out to clear the road all the way from Bansong, and the little Lama with the Raja's orders to that effect under a Red Seal in his pocket, is exceedingly attentive and most useful.

The road descends steeply from the Goreh-mendong in a north-east direction to the Jett, a rapid torrent which pours over a precepice of whitish clay slate, and rushes to the Teesta ; we crossed it over bamboos laid from rock to rock, and afterwards continued to descend in the same direction as before to the Num-moo, a larger feeder of the Teesta than the last, which we crossed at half past 8 ; a mile more along a flat terrace parallel to the Teesta brought us to the Bhalak ghaut of the Teesta, where at 9 o'clock we crossed to the East Bank by a rickety cane bridge suspended 30 feet above the water. The river is here confined in a narrow channel of rock and pours down like a sluice of dirty soap suds, so turbid is it from land slips in its upper course.

\* *Artemisia.*



It does not appear to be more than half the size it is at Bansong : hence the Ryote which is the only affluent of note between this and Bansong must be a large one ; it drains the Chola portion of the eastern snowy range, and is formed by three streams, the Dik, Ryote, and Runjung. Thermometer at Bhalak in the shade  $78^{\circ}$ . Ascended steeply from the river to about 300 feet and came along the Phajigam\* village and terrace thence to Akurthung, which we reached at noon, a flat terrace about a mile long, whence we descended by a precipitous and dangerous path to the Rungrung, running west, and crossed it a few yards above its junction with the Teesta.

This crossing is without doubt the worst place I have ever been over. From the top of an immense round rock up to which you climb on hands and knees, three bamboos are laid across the torrent at an acute ascending angle to the opposite precipice. This attained, at the imminent risk of falling into the torrent, you get to zigzag bamboos which are hung by slips of dry creepers against the face of the rock for you to walk on ; then there is a net work of knotted creepers spread over the face of the precipice by which you get to the top of a ledge or the first story of the ascent. From this there is an erect pole with notches cut in it, then a bamboo ladder, next another notched pole of 22 steps, which stands in a gully of the rock and over which a streamlet trickles, and lastly you have to crawl up the head of this dripping gully to reach the top. The whole ascent arranged in this singularly ingenious, but very dangerous manner, must be above 200 feet. It needs a steady head, and firm tread to manage it. The smallest slip would be fatal. The rivetting of the attention had, I found, quite exhausted me when I reached the top. We all got up in safety, an hour's march from this brought us to Tugvia. Our general direction has been north, road distance, say 15 miles.

On the west bank of the Teesta opposite this, and north of Goreh is the Mani, a feeder of the Teesta, then "Sidoor" a Lepcha village, next "Munkiang," and north of that the run, another western feeder of the Teesta which rises from the Kim mountain.

The mountains hereabouts are very precipitous and composed of clay schist ; land-slips are common. There is a recent one above

\* Phajigam, or "Sandy plain," there is whitish clay slate debris doing duty for sand, but the plain is not perceptible.





"Sidoor" which is frightful to look at, even from this side of the river ; a few days ago a hill side came down bodily into the Teesta two marches above this, and two years ago a whole village Kemam was destroyed in this way, and all the people killed ; it occurred at night in a deluge of rain and in a storm.

I heard from Hooker yesterday ; he was on the 24th still at the Doukia pass, and had that day ascended the mountain close to it to 20,000 feet, and discovered another Lake the 4th of the Lachoong ones.

My Lepcha hostess of last night afforded me another trait of domestic habits. This morning, I was dressing by candlelight in my end of the house, while she was at her toilet at the other. Having got one of the boys to bring her a cup full of water in the tea-ladle, she commenced her ablutions. Wetting her hands she each time held them over the fire in the smoke, and then rubbed them over her face and arms. Then dried herself with the lousy chudder of yesterday ; rubbed her teeth twice with her fingers, and thus ended, "my lady's toilet."

*Singtam, October 2nd.*

Heavy rain all night, which ceased at daylight, but came on again at 6 o'clock.

Started at 7 in lighter rain, and reached this at noon. Thermometer at 8 P. M. in house 68° ; an easy march in the dry season as to distance, and no great ascents or descents, but just now it is very different ; general direction north-east, being the course of the Teesta. Crossed the Rung-lok, a small stream, a short distance from Tugvia, and then ascended to the Rungoon Spur along the west brow of which the road runs for two miles through an undulating and cleared country, bearing excellent crops of rice and murwa, now ripening. There is also a good deal of grass, and the cows are remarkably fine and numerous. It is well peopled, principally by Lepchas who have good houses, and is in the jurisdiction of the Singtam Soobah, who lives a little farther on at "Rufam," from which we ascended steeply to "Shem," a spur from the Enden mountain, and thence descended to Singtam. The road through the cultivation of Rungoon is ankle-deep in mud, and on the steep descent to this place it was impossible to move alone with



shoes on. With a stick in each hand and a Lepcha holding on by each arm, slipping was not to be avoided.

The opposite bank of the Teesta is extraordinarily precipitous, and in many places the scarpd rocks for 1000 feet descend almost perpendicularly to the river. The course of the Teesta here is east and west, which it takes from the Saklang ghaut south of this, and at the foot of the Shem spur. It was by the Saklang ghaut that Hooker crossed in May last, having kept the west bank of the river that far from Goreh opposite Singtam. Bearing north is the Sufo mountain, lower down Likla, and west of that is "Sakiong."

The Kuloo mountain above last night's encampment is a favourite site for devotees, who retire for a time into the jungles to do penance and devote themselves to abstraction and religious contemplation. This feature of Hinduism is in considerable repute among the Buddhists in Sikim, females as well as males of the religious order adopting it. One of the present Raja's daughters is a Nun-Auni—and has in this way segregated herself from the world for 11 years. While thus engaged the individuals are objects of veneration, and perform religious exercises and incantations for all applicants.

There is a Goomba at Rungoon, the head Lama of which is a Lepcha. It commands a noble view of the eastern flank and spurs of Kunchinjinga, but we were enveloped in thick clouds, and I saw nothing as we passed.

I found an Indian-rubber tree, called Yok-koong, close to the last ground at Tugvia. Caoutchouc is made in Sikim, but the only use it is applied to is for lining baskets to hold fermented murwa for making beer.

There is a crop grown here which I never met with before; it is called "Kundep," and is now in ear; it is grown like rice, and is something like it, but taller and stronger in the stem, and the grains are separate, on long pedicles, and twice the size of those of rice. It is said to be nutritious, and to taste like Indian-corn. When eaten it is boiled like rice and is previously husked in the same way. Three climbing edible plants are cultivated hereabouts, the Botanical names of which I do not know.

1st.—"Kucho-pote," a round brown thing like a potatoe in form and substance; it is formed on the stem of the plant which is a slender



climber, and is supported by long hop poles. It is eaten, boiled or roasted, and is a sort of above-ground yam.

2nd.—“Kusok,” a black round substance like the above in structure, but the size of a prune; it is similarly grown on hop poles, and eaten roasted or boiled. It is a handsome plant with large digitate leaves.

3rd.—“Tukoombi,” another climber. The edible part being black currant-like berries, which are roasted or boiled when eaten.

I have got into a Lama's house here and am dry and comfortable; but these people do not make the most of their houses which are really very good. They are all raised 4 to 8 feet from the ground, which at first sight would promise exemption from damp; the flooring, however, is of loose boards, with intervals between them, and as pigs, fowls, goats and calves live below you, and the ground is a perfect puddle, you have damp and noisome air incessantly about you. The cows too take shelter under the eaves and hang about the houses, so that dirt and slush surround you. This is the state of things during the rainy season, and different indeed it is from that which you find both at the house, and on the road during the cold weather, to which alone the English notices of the Himalaya generally refer.

*Miangh, October 3rd.*

Heavy rain all night. We started at 6 A. M. in a drizzle, which soon became a right down pour, and this continued until 11 when it brightened, and we reached this place at noon. The peculiarities of travelling in the rains were displayed in all their force and glory. Our route lay along the north-west side of Rungeelah, and above the Teesta south bank, with occasional descents to feeders of the river which we crossed, and ascents to their corresponding spurs, the general line being about the elevation of Singtam, until we made a long descent to this place which is about 500 feet above the river. The Koormi, Bungkiong, and Bungchi are the principal feeders on the route, they came dashing down their smooth narrow beds of quartz rock, occasionally impeded by immense round masses of rock through which they rush thick with mud and clay-slate debris, the foaming flood being the colour of dirty soap-suds. The crossings are very difficult;—the deepest places are passed over on rickety sticks or bamboos, the remainder by crawling on hands and knees from rock to rock and by wandering.



The road was very muddy all the way, and we had to toil through peaty slush in many places more than ankle-high. The leeches were most troublesome, half a dozen at a time fastening through the stockings, and it often sickened me to see the bloody water bubbling through my shoe laces as I toiled along. Peepsas and midges were all the time busy at my hands and face.

The course of the Teesta here is nearly east and west, and its bed is now gorge-like the mountains on the north side being almost perpendicular, and on this side but little less abrupt.

The Ramam is a large feeder from the north, and just below its junction with the Teesta there is a cane suspension bridge; above it is the great landslip already noted and which recently carried a whole village into the river.

We met some excellent cows to-day, and I would have bought some, but they could never get to Darjeeling, and until a road is made in this direction the cattle of Rungoon must continue to die in the land of their birth, for no cows could travel where we came along to-day. Another day and no views of Kunchinjunga; it cannot be helped, and I hope for better skies as we return. I had however a glimpse of Lemteng across the Teesta, it is a well cultivated mountain-side above the Rungjung river. The road to the Taloong Pass goes through it. This pass leads to Shanok in Thibet, a district of Digarchi. There is a little trade across it, but the difficulties of effecting a passage are very great, and the route is but rarely attempted.

*Chakoong, October 4th.*

Heavy rain again all last night, but it ceased by daylight, and at 6 o'clock we started; passed "Namgah" at 8, and reached this at noon. Thermometer at 8 P. M. 70°. Miangh is a place to be remembered albeit *not* memorable; my tent was soaking wet, there was no village near, and I therefore had a hut built of long grass and plantain leaves; it defended me pretty well from the rain although it fell in torrents; but I was a prey in the day to Peepsas and all night to fleas, bugs, musquitos and another creature more venomous than all of them, a sort of gnat, the bites of which are greatly inflamed and intolerably itchy. I am speckled purple all over from the industry of these creatures, and my feet and ankles are swollen and very painful from yesterday's leech bites. These animals, the leeches, I can, I



hope, defy for the future. The little Lama, seeing the plight I was in this morning, recommended me to roll moistened tobacco leaves round my feet. I did so, and with the most perfect success; I had not a leech bite all day, and when I took off my shoes a dozen were dead on the stockings under the tobacco leaves, not having done me any damage.

Miangh is a flattish terrace overgrown with a rank jungle of reed grass, wormwood, &c.; the soil, a rich black peaty loam saturated with moisture and covered here and there by small stagnant pools of water.

Although the place has apparently all the requisites of virulent malaria, it is said, and I hope truly said, to be quite healthy. Indeed the whole valley of the Teesta above Bansong is considered by all the people in this direction to be free from malaria; if it be so, the fact must, I think, be attributed entirely to the precipitous character of the mountains bounding the valley, which rise almost perpendicularly from the bed of the river to the height of 2000 feet.

They are however generally clothed with a dense forest; and although the action of the sun on decaying vegetable matter may doubtless be much limited by the near approach of both banks, the decay of vegetable matter must nevertheless be very great, and on the terraces such as that of Miangh the putrid smell covered by it was most offensive. If it shall really turn out that malaria is not rife and powerful here, an opinion which I have long held, that an expanded horizontal surface in the mountain valleys is essential to the generation of this mysterious and pestilent agency, will be confirmed. Rank vegetation, a retentive soil, and profuse moisture alone, will not produce it if it be not generated here. Our present encampment is a flat terrace similar to Miangh not 100 feet above the river; it is composed of sandy soil, and is occupied by fine alders and young birches; it is also considered quite healthy. Landslips appear in many places, and on both sides of the river. This is quite characteristic of the Teesta above Goreh. Last evening at 5 o'clock I was startled by what I believed to be a great explosion in the sky, followed by what seemed to be an increasing peal of thunder. It suddenly ceased, and not being followed by any thing similar, and there being no lightning afterwards, I was puzzled to account for the phenomenon. This morning, however, some of my people who were encamped a little lower down the valley, asked me if



I had heard the crash at that hour, and said it was caused by a great landslip on the opposite bank of the river.

To-day I have heard about a dozen of these crashes, and they are followed by a rumbling noise as the masses of rock are carried down by the current, which is a boiling flood throwing waves up in the narrow parts of the channel 20 feet high.

After leaving Miangh we descended to the feeder of that name, and crossed it by a rickety suspension bridge, the side rails of which, as well as the footing, were covered with a thick slime, and exceedingly slippery. It was a foaming cataract where we crossed. The bridge hung 40 feet above it, and many of the coolies clung to it in evident alarm, and were very dizzy. At 9 o'clock we reached the Rune, and crossed it also by a suspension bridge hung just below a fall of about 50 feet, and about 100 yards from its junction with the Teesta. It was a continuous bed of roaring foam for about 1000 feet above the bridge, and below it all the way to the river. I stopped midway to gaze at the extraordinary sight, and got soaking wet with the spray from the cataract. It was a noble sight ; the rainy season only can give such sights in Sikim, where waterfalls and cataracts are very rare. Between the Rune and this place, Chakoong, three hour's walk, our road lay close to the Teesta, varying from 200 feet above it down to its level, and in that distance we had to cross 8 or 10 landslips of varying extent, some quite recent and extending from 1000 feet above us down into the river. They were all sufficiently difficult to cross, and none of them well free from danger ; one in particular was very frightful. We crossed it 200 feet above the river ; it was quite a new slip ; foot traces had scarcely been formed along it to guide us ; it was nearly perpendicular above us for 800 feet, equally so below us ; the crest of the mountain whence it had separated above, was of rock, and projecting over it so far that it looked as if it was overhanging us, our footing was of loose rubble, and over lumps of rock, and water courses just cut in it came running down its sides.

While crossing this unsettled slip the Lama who was leading, and just ahead of me looked up to the top, and instantly quickened his pace ; my eyes followed his to the overhanging summit, and my pace was quickened up to his, but not a word was spoken by any one, nor did any one delay a moment. When safe across I said, "That is a





bad bit of ground, my friend." He replied, " It is pretty safe to-day, there has been plenty of rain to take it down ; but three days of sunshine will bring it all crumbling down into the Teesta !"

I believed him, and I am satisfied that to travel on the upper Teesta in the rains needs as steady a head and as much care as any mountain journeys whatever. I can now very adequately appreciate the intrepidity and zeal which has carried Hooker through five months of it without a companion.

*Choongtam, October 5th.*

Started at 6 A. M. a beautiful morning, no clouds, and a fresh cold weather feel in the air : a lofty Snow Peak of Kunchinjinga in sight to the south-west, and Peaks partially covered with snow are in sight up the Teesta valley to the east and north. Crossed the Cha-koong, a feeder of the Teesta, two miles from camp by a suspension bridge, and at 8 o'clock crossed the Ryote by a similar bridge which hung 60 feet above the torrent. It was a bed of foam for 1000 feet above the bridge, and similarly furious in its course to the Teesta, which it joined 300 yards below. There is a cane-bridge across the Teesta, just above the junction of the Ryote. The road to-day has been exceedingly difficult and very dangerous. We had to cross more than a dozen landslips, some of them quite recent, and of very infirm footing, the river tearing past at the bottom of them with such speed and violence that nothing could resist its force. The noises from masses of rock rolling down with the current were incessant, and resembled distant volleys of musketry.

On nearing Chongtam the bed of the Teesta is considerably wider than it is lower down, a bank of loose mud and rubble is thrown up on the south side of it by the Ryote feeder, which dams up the river into a quiet lake-like expansion of half a mile long. The water was clear and green, and fringed with fine trees to the very edge. The effect was very striking and pleasing, being greatly heightened by the Chongtam hill rising at the back ground to 5000 feet, the upper portion of it 2000 feet from the summit being clothed with verdant grass. This is the first grassy land I have seen in Sikim ; it is a pleasing foretaste of what I expect beyond on the plateau of Thibet. The Lachoong river coming down from the north-east is crossed by a cane-bridge close to Chongtam, at which there is a large flat terrace, 200 feet





above the river, covered with an irrigated rice crop. Above this flat is the Goomba and Lama's house, a fine airy situation, elevation 5000 feet. There was a delightful breeze from the south all day.\*

About half way from Chakoong I met Hooker, who came down so far to welcome me. He is looking remarkably healthy and is quite robust, wears a large beard, and is sadly sun-burnt since his trip to the Passes.

*Latong, October 6th.*

Talked all night with Hooker about his visits to the Passes. Started at 8 A. M. and reached this at 3 P. M., our road all the way in the valley of the Lachen in a north-west direction, and on the left bank. We crossed the river below Chongtam by a suspension cane-bridge. At noon crossed the U'rkang. Half way is Denga, a flat terrace, about a mile long and half a mile broad, and there is a succession of similar terraces all the way to Latoong, which is much the largest of the whole, and is perhaps a mile broad at the place we encamped.

These terraces or flats are covered with an upper stratum of black peaty soil, and their general formation is sandy gravel, and roundish masses of rock down to the river bed. The average elevation of them above the river is under 100 feet. There has been a marked change in the vegetation on this march. The most prominent plants not seen below Chongtam and seen here, are the Poplar, Willow, Crab-apple, and Anemone. We saw some of Hooker's newly discovered Rhododendrons, and the Dalhousie, growing not as an Epiphytic plant, but out of the ground;—elevation of Latong 7000 feet.

At the elevation of 2000 feet above the river, the mountains on both sides are clad with pines. Ther. at 6 P. M. 55°. The road all the way from Chongtam is most difficult; along the terraces it is ankle-deep in mud and black soil, and in the other parts it is across landslips, or violent torrents, or over immense rocks in the river's bed. Leeches very numerous. Insects infested the tent all night.

. (To be continued.)

\* Choongtam, and the whole country south of the Kungra Lama and Doukia passes, was occupied by the Thibetians for many years, and at length restored to Sikim by negotiation.



*Literary Intelligence.*

Mowlawy Ahmad 'Alyy has published a lithographed edition of the text of the Mishkát with few and short, but very useful marginal notes, derived chiefly from the Mirqát. The Mishkát with 'Abd al-Haqq Dihlawy's Persian translation and commentary has been published at Calcutta (in type) in four folio volumes, in 1259, and subsequently with an Urdu translation and commentary (lithographed) at Dilly equally in four volumes. Mowlawy Ahmad Aly has also made a new edition of the Tafsyr Jalályn, this edition is more correct but not nearly so clear as the Calcutta edition, 1257 folio. The same Mowlawy, who surpasses all his contemporaries in erudition, has completed two thirds of his edition of the traditions of Bokháry, mention of which has once been made Vol. XX. p. 282. He has favoured me with the portion which has been printed. It is a splendid folio 17 inches high, it has 710 pages, and contains twenty chapters: ten chapters remain to be printed. Wherever the vowels throw light on the sense they have been carefully fixed, and the text is farther illustrated by admirable glosses on the margin and between the lines, taken from the Fat'h al-Báry and other celebrated commentaries.

Mr. Lees of the 42 N. I. is editing under the auspices of the Society in the Bibliotheca Indica the conquests of Syria by the Pseudo-Wáqidy, with an English translation. He has two MSS. one belongs to Colonel Rawlinson and the other to a Mowlawy at Cawnpore, both are of considerable antiquity and written with care. In addition to these two MSS. a more authentic book on the conquests of Syria has been discovered. It is one of the most ancient Arabic manuscripts that I have seen and was probably written in the fifth century of the Hijrah. It is unfortunately imperfect and it has therefore been impossible to ascertain who the author is. The Asnád are not those of the Tabaqát al-Wáqidy and but few of the men mentioned in the Asnád can be found in the books on the Asmá Alrijál. They were probably heretics and are therefore not mentioned in the biographical works of the orthodox Musalmans. This leads me to suppose that the author is Madâ'yiny (died in A. H. 225.) This MS. will probably be printed as it is, as an appendix of Mr. Lees' edition of the Pseudo-Wáqidy.

Another work of very great importance the publication of which in the Bibliotheca India is in contemplation is the كشاف اصطلاحات الفنون by Mowlawy Mohammad A'lá b. Shaykh 'Alyy of Saháranpúr who



died about sixty years ago. He spent nearly the whole of his life in the compilation of this work. It contains the technical terms of all the sciences cultivated by the Musalmans, and what gives it a particularly high value is that the definitions and explanations are taken verbatim from the most authentic text books and commentaries of the respective sciences, there are therefore collected in it the opinions of the most distinguished authors. Of those sciences which are still cultivated, and well known, the author contents himself by explaining the technical terms but in those sciences of which books are rare he enters deeper into the subject and gives in fact a compendium of the leading points. The book is very much like our Encyclopedias. In extent it is equal to, or larger than the Qámús, and if its publication should be decided upon it will be desirable to print it in the same form as the Calcutta edition of the Qámús. At present two MS. copies are at the disposal of the Society and it is very likely that we shall be able to obtain one of the three copies which the author has written with his own hand.

Capt. F. Hayes intends to publish in the Bibliotheca Indica the Tazkirah of Persian poets by Abú Tálíb Khán which was compiled in A. H. 1206 and of which a very learned notice from the pen of Mr. Bland has appeared in the Journal of the Royal As. Soc. Lon. IX. p. 153. Capt. Hayes is Assistant Resident at Lucknow, and he will find in that city a very carefully written autograph copy which is preserved in the Faraḥ-baksh library.

Among the new books which have been lately lithographed at Lucknow are the following :—

سرور سلطانی. A translation into Urdu of Shamsheer Khán's prose version of the Sháhnámah, by Myrzá Rajab Alyy Sorúr. The book is in rhymed prose and in an idiom which is peculiar to the literati of Lucknow, it is neither Persian nor Hindustáni but in the whole approaches nearer to the former than the latter. It is dedicated to the illustrious Ruler of Oudh and to one of his Dóms. The print is remarkably clear, it has 312 pp. 8vo. مولد شریف منظوم. The birth of Mohammad in Urdu verses composed in A. H. 1251 by Gholám 'Abbás Khán and lithographed in 1267 12mo. 48 pp.

توضیح و تلویح (4to. 423 pp. lithographed in 1267) On the author and contents refer to Hájy Khalyfah No. 3674.





PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR MAY, 1852.

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The usual monthly General Meeting of the Society was held on the 5th instant, at half-past 8 P. M.

SIR JAMES COLVILE, KT., *President*, in the Chair.

The proceedings of the last meeting were read and confirmed.

The following presents made to the Society were exhibited.

1st. A palm leaf MS. of Kattyáyana's Páli grammar in the Burmese character found in a monastery at Rangoon. Presented by Dr. Fayerer.

2nd. The Memoirs of the Academy of Sciences and Arts of Lyon, for 1848—50. Presented by the Academy of Sciences and Arts of Lyon.

3rd. The Transactions of the Royal Bavarian Academy of Sciences. Presented by Mons. W. Thiersch, President of the Academy.

4th. The latest publications of the Royal University of Christiania, as per Library report. Presented by the Secretary of the University.

Lieut. E. Burgess, N. I., was named for ballot at the next meeting, —proposed by Capt. Thuillier and seconded by Mr. Grote.

Read Letters—

1st. From Dr. W. B. O'Shaughnessy, tendering his resignation of the office of Vice-President of the Society, on account of his departure to England on public duty.

From Professor Fleischer, Secretary of the German Oriental Society, acknowledging the receipt of the Bibliotheca Indica, Nos. 15 to 33.

From the President of the Royal Bavarian Academy of Sciences, acknowledging the receipt of the Journal, Vol. I to IV, and the Calcutta Journal of Natural History, Nos. 1 to 16.



From the Secretary of the Royal Institution, Albemarle Street, acknowledging the receipt of the Journal, Nos. 218, 221 to 224.

From Dr. Lamb, Senior Member of the Medical Board, enclosing an abstract of Registers of Temperature and Fall of Rain kept by medical officers in different parts of India. Ordered for publication in the Journal.

The following letter from Lieut. Burgess, dated Pillibheet, was communicated to the Society by Capt. Thuillier.

“The following particulars of a severe shock of earthquake on the evening of the 31st March last, may not be uninteresting to the Asiatic Society.

“It commenced about 8h. 28m. P. M. mean time, Longitude  $79^{\circ} 44' 91''$ , the wave appearing to come from between the North and N. W., and in a few seconds the shocks became so violent and rapidly repeated, as to render it difficult to stand. This was succeeded by a gradually decreasing tremulous noise, which became imperceptible at 8h. 29m. 24s. It was accompanied or preceded by a heavy rumbling or rushing sound as of an approaching storm. The day had been excessively sultry, but a thunder-storm had cooled the air in the afternoon; the thermometer at the time stood at  $69^{\circ}$ .

“The time is correct for the place, but it is possible the longitude may be a little out: if it is desired, I will send the correction on that account hereafter.”

Professor Oldham remarked, “that it would be very desirable if the Society could take advantage of this opportunity to direct the attention of observers, who might have an opportunity of noticing the phenomena connected with earthquake shocks the great value of determining, if possible, the exact time, relatively, at which the wave was felt at distant points. It was now almost an admitted fact in the science, so to speak, of earthquakes, that the rate of transmission of the shock was a function of the class or kind of rock or soil, through which it was transmitted. It becomes therefore very interesting to determine this rate of transmission for given localities. And as India presented so remarkable a continuity in its Geological formation, the same rock extending sometimes for hundreds of miles, there were peculiar opportunities in this country for determining this question. With a view to this point, it was not of so much importance to determine with great



accuracy the absolute time, whether near, or true, at which the shock occurred at any given locality, (although this was very important when it was possible,) but to fix with the greatest attainable accuracy the exact *relative time* at which the same shock was felt at different and distant localities. There would always be some difficulty in doing this accurately, but he believed that in many instances it had not even been attempted; although he thought much service might be done, if the attention of observers were directed to this enquiry."

The Librarian and the Curator of the Zoological Museum submitted their reports for the last month.

Thanks having been voted for the above communications and presents—the meeting adjourned.

(Signed) JAS. COLVILLE.

Confirmed, June 2nd, 1852.

*Report of Curator, Zoological Department, for May, 1852.*

The following donations have been received :—

1. From Capt. Berdmore, Madras Artillery. A box of skins from Mergui, comprising several species of much interest.

Among the Mammalia, is a specimen of *GALEOPITHECUS VOLANS*, not heretofore obtained from so northern a locality; *SCIURUS CHRYSONOTUS*, nobis;—*MUS*——? Affined to *M. FLAVESCENS*, Gray, except that its upper-parts are of a much darker colour, and the caudal rings and setæ are very much coarser; the white lower-parts contrasting strongly; an adult,  $\frac{1}{2}$  grown young, and small young;—and, lastly, an imperfect skin of a young calf of the *Tsain* or "Wild Ox" of the Tenasserim provinces, *BOS SONDAICUS*, Muller, which there co-exists with *BOS GAURUS* but not the *BOS FRONTALIS*.\*

\* So far as we have seen, the horns of *B. GAURUS* of the Tenasserim provinces and Malayan peninsula are constantly shorter and somewhat more abruptly curved than in Indian specimens; and the following description of the Malayan animal would seem to indicate that perhaps the species is not absolutely the same, however closely it may be affined. In the Journal of "a trip to the Moar river" district, published in the 'Journal of the Indian Archipelago, Vol. IV, p. 354, two species of wild cattle are mentioned, one called *Sapandang*, the other *Sapi*; and the following is a description of a cow of the latter taken from the freshly killed animal. "The *Sapi* has much appearance of the Bali cattle" (*BOS SONDAICUS*), "but has not the white patch on the buttocks; the horns are small, curved inwards, white tipped with black; the forehead is flat, with a tuft of long hair on it, particularly



The birds also comprise species, of more or less interest, either intrinsic or in connexion with the locality. Such are *PERNIS BRACHYPTERUS*, nobis, *n. s.*; *PODICA PERSONATA*, G. R. Gray; and *HERODIAS IMMACULATA*, Gould. We had not previously seen the common "Java Sparrow" (*AMADINA ORYZIVORA*) from so far northward. The *ARGUS GIGANTEUS*, *EUPLOCOMUS IGNITUS*, *ROLLULUS CRISTATUS*, and *R. (?) OCELLATUS* abound in the province; *CASARCA LEUCOPTERA*, nobis, has hitherto been only there met with; and *CRYPsirina varians* and *MACROPYGIA AMBOINENSIS* are species common to the province and to the island of Java, neither of which have we seen in collections from Penang and Malacca:

*in the bulls.* The back is curved, the highest part being about the centre: the spines of the vertebræ are unusually long. The total height of the animal killed, from hoof to spines of dorsal vertebræ, was 6 ft. 2 in. The hair was smooth and silky, of a brown colour, except on the feet which were a dirty white; a mane of about 2 in. long, ran the whole length of the spine. There was no dewlap, and the whole appearance of the animal was decidedly game. The fibre of the flesh was fine, well mixed with fat, and proved decidedly the most delicious meat for flavour, tenderness and juiciness, that ever any of us tasted." "The other species of wild cattle (the *Saladang*) we did not see, although we met their tracks every day. The Malay guide told us that the meat was coarser than that of the Buffalo and not good eating; but that the animal was much larger than the *Sapi*, some of the bulls growing to seven 'astas.' This is the moderate height of 10½ ft. My readers may believe it or not as they please. I am rather sceptical myself, and only relate what was told me by a man whose statements we found correct as far as we had the opportunity of testing them." At all events, what the Malayan *Sapandang* is, remains to be determined; and the Indian *Gaour* has neither the tufted forehead nor spinal ridge of lengthened hair described of the Malayan *Sapi*. The *Banteng* does not appear to have hitherto been observed in the Malayan peninsula; but Capt. Phayre has presented the Society with the horn of a cow from Arakan, and we also have (belonging to him) the frontlet of another cow from Pegu remarkable for the whitish colour of the horns, thus verifying Pennant's account of white-horned wild cattle in the Indo-Chinese territories. These can be compared with our fine frontlets of Malay *Bantengs* from Java. The species also inhabits Bali, Sombok, and part at least of Borneo; but in Celebes there would seem to be a distinct and undescribed Wild Ox, (vide 'Journal of the Indian Archipelago,' Vol. II, p. 831, translated from the Dutch.) "A skull with horns of the wild cow of Tenasserim" was presented to this Society at its meeting for February, 1831, (vide Gleanings of Sciences, III, 61, where some notice is given of the animal;) and for further details respecting the various wild oriental cattle, vide *J. A. S.* Vol. XI. p. 444 et seq.



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\* Other species of Australian Herons figured as new by Mr. Gould appear to be perfectly identical with those of India, and which are more or less diffused over the greater part of the 'Old World' or major continent and its dependencies. Thus, his *Ardea rectirostris* is *A. SUMATRANA*, Raffles, v. *fusca*, nobis, which extends its range to Arakan and the valley of the Brahmaputra : but his *A. LEUCOPHÆA* is not (as he avers) the common Indian Heron, which is true *A. CINEREA*, L. (v. *A. bruh* of Jacquemont's *Atlas* ?), identical with European : and Chinese examples ; and the Egret group, which seems still to be in a considerable state of confusion, we will here make some attempt to elucidate. The Asiatic species are as follow. A. With pure white plumage at all ages.

1. H. ALBA : *Ardea alba*, L. ; *A. egretta*, Tem. ; *A. modesta*, Gray ; *A. flavirostris* et *A. melanorhynchos*, Wagler ; *A. torra*, Buchanan Hamilton and Franklin ; *H. syrmatorphorus*, Gould. Hab. S. E. Europe, Asia and its islands, Africa, and Australia ; very common in India. This is by far the largest species, measuring generally about 3 ft. to tail-tip, by 4½ ft. in. alar expanse ; closed wing 14 in. beak to frontal plums 4½ in. ; tarse 6½ in. ; middle toe and claw 4½ in. The bill is black in the breeding season, and becomes so before the dorsal train is put forth ; and the train is retained for some time after the beak has changed back to yellow ; so that both black-billed and yellow-billed examples are seen with and without the train. The latter is straight to the extremity, and in fine specimens passes 4 or 5 in. beyond the tail-tip. No crest nor supplementary neck-plumes pendent over the breast. Bare portion of tibia either wholly or commonly in great part pale or albescent, suffused with purplish red ; and sometimes the tarse and toes are also partially of this hue, the rest being black. In the height of the breeding season the loreal and other naked skin at base of bill is of a beautiful pea-green approaching to verditer ; at other times bright wax-yellow. Irides pale yellow. *Remark.* Temminck and others describe a small pendent occipital crest to this species, which we have never seen, though many dozens of fresh specimens in the finest nuptial plumage have passed under examination. Temminck further asserts that Japanese examples are similar but rather smaller ; but he does not shew that he has remarked this in a sufficient number of instances. The American *H. GALATEA*, (Molina, *Ardea leuce*, Tem. ; ) differs in having shorter legs and toes, which are wholly black ; and from the published figures it would seem that the train is



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PERNIS BRACHYPTERUS, nobis, *n. s.* A much injured skin of a very beautiful species, conspicuously distinguished from *P. CRISTATA* by the comparative shortness of the wings and tail, and by a plumage more intense in colouring and contrasts than we have ever seen in *P. APIVORA* or *P. CRISTATA*. Length of closed wing 13 in. only; and of tail but  $8\frac{1}{4}$  in.

longer, as in the next species: according to Degland, they may further be distinguished readily when in breeding livery, by the stems of the train-plumes being flattened in *H. ALBA*, and "relevée, à côte," in *H. GALATEA*.

2. *H. INTERMEDIA*: *Ardea intermedia*, Wagler; *A. egrettoides*, Tem.; *A. nivea*, Lesson; *A. flavirostris*, Bounaterre; *A. putea*, Buch. Hamilton; *A. nigrirostris*, Gray; *H. plumifera*, Gould. Hab. as last, the two species commonly associating in one flock. In the Malay countries it would appear to be the most common species of white Egret, and Temminck states that it differs in no respect in Japan. It is considerably smaller than *H. ALBA*, with much shorter beak, and long straight dorsal train in the breeding season, reaching nearly or quite to the ground. It has also beautiful long pendent breast-plumes of similar texture to the train; but no occipital crest. The beak changes colour as in *H. ALBA*; but the tibia is never (that we have seen) whitish as in that species, and this is the only difference we can perceive between the Indian bird and Gould's description and figures of *H. plumifera* from Australia. The facial skin, also, does not (that we have remarked) become green during the breeding season. Bill to forehead 3 in.; tarse  $4\frac{1}{2}$  in.; middle toe and claw 4 in.; closed wing 12 in.

3. *H. GARZETTA*: *Ardea garzetta*, L.; *A. xanthodactyla* et *A. nivea*, Gmelin; *A. orientalis*, Gray. Hab. as preceding species, with the exception of the great Austral-asian archipelago and Australia (so far as observed hitherto). Bill black at all seasons, with whitish at base of lower mandible and at the extreme base also of the upper. Feet black with yellow toes. Dorsal train curved upward at the extremity (quite as much so in fine specimens as in the American *H. CANDIDISSIMA*, though represented as straight in the wood-cut to Yarrell's 'British Birds'). Occipital crest consisting of two or three (generally two) long narrow pendent plumes measuring about 6 in. in fine specimens; but these appear to be only worn for a short season; and there are lengthened nuchal plumes of similar texture pendent over the breast. Bill to forehead  $3\frac{1}{2}$  in.; tarse 4 in.; middle toe and claw exceeding 3 in.; closed wing 10 in. There is much variation in the depth and quality of the yellow colouring on the toes. When much in quantity it is pale and greenish, and extends more or less up the tarse, even to the tarsal or heel joint, and the claws are then commonly whitish-horny. When contracted in quantity it is of a deeper and buff yellow, with sometimes the tips of the toes and the claws black, all or a portion of them. Hence it may be suspected that varieties of this bird with wholly black toes occur sometimes, and the same also probably in the affined *H. CANDIDISSIMA* of America, which has similar yellow toes, imparting an appearance as though the bird had been





Symphysis of the lower mandible much shorter than in *P. CRISTATA*. The corneous sheath of the upper mandible wanting in the specimen. Upper parts fine deep hair-brown, with a rich maronne gloss. Occipital crest ample, broad,  $2\frac{1}{4}$  in. long, the feathers composing it white-tipped, as are also those adjacent. Wings obscurely banded, as seen from above ;

treading in some yellow substance : but such specimens would not constitute the *H. MELANOPUS*, (Wagler, vel *A. nigripes*, Tem.,) which has other distinctions and would seem only to differ from *H. IMMACULATA* in being larger and longer-legged than *H. GARZETTA* instead of the reverse. According to Temminck, throughout all Asia to Japan the species is true *GARZETTA*, but that of India and the Sunda Isles is different, being his *A. nigripes*, which also extends as far as N. Guinea. (By the term "India" is here doubtless meant *Netherlands* India, for in India proper the *GARZETTA* abounds to the exclusion of the other). So far as we are aware, *H. GARZETTA* can only be distinguished from *H. CANDIDISSIMA* when both are in breeding plumage, however little of this may be developed ; the American bird acquiring a full crest of loose feathers, and pendent breast-plumes of similar texture to the train (as in *H. INTERMEDIA* only less developed).

4. *H. IMMACULATA*, Gould : *Ardea melanopus* (?) Wagler ; *A. nigripes* (?) Temminck. Hab. Australia ; Mergui ; the Malayan peninsula and great Asiatic archipelago to N. Guinea and perhaps N. Ireland ? Rather smaller than *H. GARZETTA*, with much shorter toes, which are not yellow as in that species, but black very slightly tinged with yellow. Dorsal train short and straight, or shewing but the slightest possible tendency to recurve, and not passing beyond the tail-tip. Occipital crest consisting of a longitudinal series of numerous lengthened slender plumes, similar to the two or three composing the crest of *H. GARZETTA* but not so large, the longest measuring about  $3\frac{1}{2}$  in. Pendent breast-plumes as in *H. GARZETTA*. Beak from forehead  $3\frac{1}{2}$  in. ; tarse  $3\frac{1}{2}$  in. ; middle toe and claw  $2\frac{1}{2}$  ; hind toe and claw  $1\frac{1}{2}$  in. ; closed wing 10 in. If correctly referred to *MELANOPUS* v. *nigripes*, this species would appear to replace *GARZETTA* in the Austral-asian archipelago and continent of Australia. With its particular habits we are unacquainted, but they are probably those of *H. GARZETTA*. The latter species is much more familiar with man and also much less highly gregarious than *H. ALBA* and *H. INTERMEDIA*. We have seen enormous flights of the two last named Egrets in company (but *ALBA* much predominating), extending as far as the eye could reach all around, the whole proceeding in one direction over low marshy ground to or from some favourite feeding place, passing just above the reach of gun-shot, and certainly constituting a single loose yet not very straggling flock. Also, the numbers of these birds which may occasionally be put up from a small reedy tank or jheel, where perhaps but two or three had been observed on approach, notwithstanding their size and very conspicuous brilliant whiteness, are astonishing and would hardly be credited if not witnessed.



more strongly on the concealed portion of the feathers. Lower parts pure white, with broad dark medial streaks or tears on the plumage of the breast and flanks: under tail-coverts broadly banded with dusky on a

B. Of the group exemplified by the American *H. CÆRULEA* and *H. RUFESCENS*, which are white when young, and chiefly or wholly of an ashy or deep slate-colour when fully adult, there is one Indian representative.

5. *H. ASHA*: *Ardea asha*, Sykes; *A. gularis* (?); *H. pannosa* (?), Gould. Hab. Peninsula of India and Ceylon; Arabia? N. E. Africa? Australia? And, if the latter, doubtless also the intervening countries. We have seen few specimens of this bird; but three examples in our museum indicate the following phases: Young wholly pure white, with a slight and irregular intermixture of slaty upon a few of the feathers of the back, wings and tail, in no instance occupying more than a small portion of a feather in the subject under examination, except in one winglet feather upon one side only. In some specimens this slaty intermixture is probably more developed, in others probably wanting altogether. Adolescent or adult in first breeding plumage, slaty, with large white throat-patch which appears to be permanent, and also white abdominal feathers and lower tail-coverts and an admixture of the same along the lower part of the front of the neck. In the specimen under examination one winglet is almost wholly white, and the other partially so but to a much less extent. Only one occipital crest-plume remains, which with those pendent over the breast are narrow and pointed with coalescent webs, as in the two preceding species. Train short, straight, not reaching to the end of the tail, consisting of true Egret plumes, but tipped for some distance similarly to the breast-plumes. This specimen must have been procured late in the breeding season. The third specimen is unmixed slaty with the exception of the throat-patch. It had shed its crest, pendent neck plumes, and train, and had begun to put forth new feathers upon the wings of a pure deep slaty hue, contrasting with the faded and embrowned appearance of its old plumage. Legs blackish in all, with yellow toes, this colour extending more or less up the tarse, and occupying more than half of the tarse in the white specimen. Bill apparently pale yellow in the young, the upper mandible tinged with dusky in adults. Length of bill to frontal plumes  $3\frac{1}{2}$  in.; tarse  $3\frac{3}{4}$  in.; middle toe and claw  $2\frac{3}{4}$  in.; closed wing 10 in. Mr. Gould's figure of his Australian *H. PANNOSA* would appear to represent a fully adult in breeding costume, having the train somewhat longer and fuller, and a little turned up at the extremity; and the toes would seem to be represented of not sufficiently bright a yellow colour.

The next species is nearly affined to *H. JUGULARIS* of Australia and N. Zealand, as figured by Mr. Gould, but would appear to be a smaller bird with very different relative proportions. Of *H. JUGULARIS*, there would seem to be a permanently white variety at all ages (the *H. Greyi*, Gray), which also is figured in Gould's Birds of Australia.



fulvous-whiteground. Tail lightish brown, obscurely waved; with a broad medial black band, another subterminal, and a third narrower near the base. We doubt this being either of M. Lesson's supposed species; and it certainly is not the ordinary Malayan type of *PERNIS* figured by Dr. S. Muller, which is identical with the Indian *P. CRISTATA*, at least that of

6. *H. CONCOLOR*: *Demigretta concolor*, Blyth, *J. A. S.* XV. 372. Hab. Arakan, Nicobar Islands. Like *H. ASHA* in general appearance, but altogether stouter, with longer wings and shorter tarse; generally of an uniform dark slaty hue throughout, with sometimes a white line down the middle of the throat, and occasionally perhaps a buff line as in some examples of *H. JUGULARIS*. The crest feathers are looser with more disunited webs than in *H. ASHA*; the pendent plumes over the breast are similar; as also the train, except that the long narrow tips occupy a much larger portion of the plumes. Bill yellowish mixed with brown. Toes and claw more or less of the shank yellow. An adolescent young specimen retains two or three of its nestling wing-coverts, which are dull slaty with broad pale tip; indicating that the young are dark like the parents, but have at least the wings speckled like the young of *NYCTICORAX*, *BUTORIDES*, &c. Bill to forehead  $3\frac{1}{2}$  or  $3\frac{3}{4}$  in.; tarse 3 in.; middle toe and claw  $2\frac{1}{2}$  in.; closed wing 11 in.

The next and last to be noticed is pure white when young or in non-breeding livery, with the exception of constantly a rusty tinge on the crown, and sometimes on the ear-coverts; but in breeding dress the head and neck-plumes are largely tipped with bright glistening rufo-fulvous, and the train consists of straight hair-like feathers, of an albescent rufous hue. Bill small and weak; and the habits of this bird are remarkable, as it rarely fishes, but feeds mainly on grasshoppers and other insects, to obtain which the flocks commonly associate with herds of cattle grazing.

7. *H. BUBULCOUS*: *Ardea bubulcus*, Savigny; *A. lucida*, Rafinesque; *A. equinoctialis*, Montagu; *A. coromandelensis*, Stephens; *A. bicolor* et *A. ruficapilla*, Vieillot; *A. russata*, Temminck; *A. affinis*, Horsfield; *A. coromandelica*, Lichtenstein; *A. Veranii*, Roux; *A. leucocephala*, Cuvier; *A. caboga*, Franklin; *A. ibis*, Hasselquist. Hab. Asia and its islands, Africa, S. E. Europe. Bill bright yellow at base, orange towards tip; legs dull black, greenish underneath the toes; in the young pale greenish. Bill to forehead  $2\frac{1}{2}$  in.; tarse  $3\frac{1}{2}$  in.; middle toe and claw  $3\frac{1}{2}$  in.; closed wing 10 in.

*Remark.* The texture and colouring of the train approximates this species to the *ARDEOLA* group, consisting of *A. COMATA*, *LEUCOPTERA*, *SPECIOSA*, and probably *LUDOVICIANA*; while the preceding species somewhat approximates the *BUTORIDES* group, composed of *B. JAVANICA*, *VIRESCENS*, *GUTTURALIS*, *STAGNATILIS*, *MACRO-RHYNCHOS*, &c., if not also the *NYCTICORAX VIOLACEUS*, *suctorum*. *H. CONCOLOR* would indeed range naturally as a small typical *ARDEA*, but can hardly be separated from *H. JUGULARIS* with its white variety, wherever this be stationed; and the great





S. India, having the crest more developed than we have ever seen in Bengal specimens.

2. From Babu Rajendra Mallicka. A fresh specimen of *TANYGNATHUS SUMATRANUS*, mas.; differing from the female in having a coral-red upper mandible instead of a fleshy-white one.

E. BLYTH.

#### LIBRARY.

The following additions have been made to the Library since the last meeting.

#### *Presented.*

Gelehrte Anzeigen. Vols. 26, 27.—BY THE ROYAL ACADEMY OF SCIENCES, MUNICH.

Abhandlungen der Koeniglichen Bayerischen Academie der Wissenschaften, part 2 of Vols. 21, 22, and 23.—BY THE SAME.

Bulletin der Koeniglichen Akademie der Wissenschaften, Nos. 1—52 of 1848.—BY THE SAME.

Denkrede auf Joseph Gerhard Buccarini gelesen in der öffentlichen Sitzung der Koniglichen Bayerischen Akademie der Wissenschaften am 28 Marz, 1848, von Carl. Fried. Phil. v. Martius. 4to. Pamphlet.—BY THE SAME.

Denkrede auf J. J. Berzelius, gehalten in der öffentlichen Sitzung der Königlich Bayerischen Akademie der Wissenschaften am 28 November 1848, von Dr. C. F. P. v. Martius.—BY THE SAME.

Denkrede auf die Chemie in ihrem Verhältnisse zur Physiologie und Pathologie. Von D. Max Peltenkofer. 4to. Pamphlet.—BY THE SAME.

Ueber das ethische Element im Rechtsprincip. Von Professor Buchner. 4to. Pamphlet.—BY THE SAME.

Memoires de l'Academie des Sciences, &c. de Lyon for 1848 to 1850.—BY THE ACADEMY.

Indische Studien, von Dr. A. Weber, Volumes I. and II. part 2.—BY THE AUTHOR.

Zeitschrift der Deutschen Morgenländischen Gesellschaft, Vol. V. parts 3, 4.—BY THE GERMAN ORIENTAL SOCIETY.

*ARDEA OCCIDENTALIS*, Audubon, presents an instance of a purely white true Heron which assuredly cannot be referred to the group of Egrets. We should add that a Sicilian specimen presented to the Society by M. Alfred Malherbe, as *Ardea veranii*, auct., of Africa and S. E. Europe, differs in no respect whatever from examples killed in Bengal and Java.





Proceedings of the Royal Irish Academy for the years 1850-51.—By THE ACADEMY.

Transactions of the Royal Irish Academy, Vols. X. and XVI.—By THE SAME.

Om Mundtlig Rettergang og Edsborne af E. Aubert. Christiania, 1849, 8vo.—By THE ROYAL UNIVERSITY OF CHRISTIANIA.

Beretning om Kongeriget Norges økonomiske Tilstand in Aarene 1840—45 med tilhørende Tabeller. Christiania, 1847, fol.—By THE SAME.

Jury Institutionen i Storbritanien, Canada og de forenede Stater af Amerika. Af Munch Røder. Christiania, 1850, 8vo.—By THE SAME.

Udkast til Militær Straffelov med motiver. Christiania, 1850, 8vo.—By THE SAME.

Statestiske Tabeller for Kongeriget Norge Ottendo Rakke, endeholdende Tabeller over folkemængden i Norge den 31st December 1845, samt over de i Zidsnummet 1836—1845 Ugtviede fødte og døde.—By THE SAME.

Über Micha den Morastheten und seine Prophetische Schrift, von Dr. C. P. Caspari, Part I. Christiania, 1851, 8vo.—By THE SAME.

Bemærkninger Angaaende Graptoletherne af Christian Boeck. Christiania 1851, 4to.—By THE SAME.

Det Kongelige Norske Frederiks Universitet Christiania. 1845 to 51.—By THE SAME.

Nyt Magazin for Naturvidenskaberne, Vol. 6th, Parts 1 to 4.—By THE SAME.

Akademiske Love for de Studerende ved det Kongelige Frederiks Universitet. Christiania, 1850, 8vo. Pamphlet.—By THE SAME.

Transactions of the Royal Society of Edinburgh, Vol. XX. part II.—By THE SOCIETY.

Proceedings of the Royal Society of Edinburgh, Vol. II.—By THE SAME.

Journal Asiatique, Nos. 82—84.—By THE SOCIÉTÉ ASIATIQUE.

Journal of the Bombay Branch of the Royal Asiatic Society, January 1852.—By THE SOCIETY.

The Oriental Christian Spectator, for March 1851.—By THE EDITOR.

Quarterly Journal of the Geological Society, Nos. 27—8.—By THE SOCIETY.

Calcutta Christian Observer, for May 1852.—By THE EDITORS.

The Oriental Baptist, No. 65.—By THE EDITOR.

Upadeshak, No. 65.—By THE EDITOR.

Bibidhārtha Saṅgraha, No. 5.—By THE EDITOR.

Tattvabodhinī Patrikā, No. 104.—By THE TATTVABODHINĪ SABHĀ.

Purnachandrodaya, for April 1852.—By THE EDITOR.

The Citizen, for April 1852.—By THE EDITOR.





The Indian Charter, for April 1852.—BY THE EDITOR.

The Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of March 1852.—BY THE DEPUTY SURVEYOR GENERAL.

*Exchanged.*

Jameson's Journal, for Oct. 1851.

The Calcutta Review, No. 33.

The London, Edinburgh, and Dublin Philosophical Magazine, from Sept. to Oct. 1851.

*Purchased.*

The North British Review, No. 32.

The Edinburgh Review, No. 92.

Annals and Magazine of Natural History, for Jany. and Feb. 1852.

Journal des Savants, for Nov. and Dec. 1851.

Comptes Rendus, Nos. 23—6 of 1851 and Nos. 1 to 4 of 1852.

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*Analysis of the Raghu Vans'a, a Sanskrit Poem of Kálidása.—By the  
Rev. J. LONG.*

In reading through this exquisite poem in the original last year, and enjoying that delight which arises from the perusal of genuine poetry, whether the soil that produced it be India or England, I felt strongly the need there is of a guide to popular Sanskrit books, pointing out their chief design and giving an outline of their contents. The names of *Mágha*, *Bhaṭṭi*, may sound familiarly to the ear, but where are we to find a programme of their contents? To meet this desideratum with respect to one book, I here submit an analysis which I made on my perusal of this splendid monument of Kálidása's genius—it is merely designed to show the drift of the poem and the subjects brought forward—as none but a poet can do full justice to a poet's style. It is contributed as a mite to the important cause of Sanskrit literature.

The poem of Raghu Vans'a celebrates the glories of the race of Ráma of the Solar line, while the Mahábhárata, the great Indian Epic, presents us with a lively portrait of the varied adventures of the Pándus who gloried in being "the children of the moon." The Raghu Vansa ranks among the *Mahá Kávyas* or six great poems, and has been distinguished for the beauty of its similes and the power of imagination displayed by the Indian Shakspeare, Kálidása, who exemplifies in his writings the truth of Coleridge's remark "the great book of nature has been the music of gentle and pious minds in all ages."



A Latin translation was published by Stenzler in 1832, but by aiming at strict literality, the spirit of the poem has been almost extinguished in the letter. His Latin style is very inelegant and very deficient in perspicuity, so that it is sometimes almost as difficult to ascertain the meaning of the translation as of the original. It retains to a great extent the absurd system of the paṇḍits in grouping a number of words together.\*

To Kālidāsa has been assigned the title of the Indian Shakspeare on the authority of that prince of critics, Sir W. Jones. Schlegel writing of Kālidāsa's works, remarks: "the Drama of Sakuntala presents through its oriental brilliancy of colouring, so striking a resemblance on the whole to our romantic Drama, that it might be suspected the love of Shakspeare had influenced the translator, if other orientalists had not borne testimony to the fidelity of the translation." Shakspeare was once as little noticed as Kālidāsa is now, but with the advance of Oriental literature he is destined "to emerge into universal celebrity." Both Kālidāsa and Shakspeare brought the Drama to perfection out of their own original stores, independently of all models of Grecian authors. In the case of both "their lives remain almost a blank, and their very name a subject of contention." Shakspeare was neglected in England during the period of the Commonwealth, when the liberal arts and literature were proscribed as if opposed to Christianity, but to use the beautiful language of Schlegel "his fame was awhile obscured only to shine forth again about the beginning of the last century with more than its original brightness, and since then it has but increased in lustre with the course of time; and for centuries to come, it will like an Alpine Avalanche continue to gather strength at every moment of its progress." So will it be with Kālidāsa: the educated natives of this country are now all seized with Anglo-mania, as were our forefathers with the classic mania, but the time is rapidly coming when the importance of forming a vernacular literature on the Oriental model will be felt, and as Germans brought prominently to view in *England* the beauties of Shakspeare, so probably will European Orientalists bring in India those of Sanskrit literature.

There is one class of persons in this country, however, on whose ears

\* In 1849, a translation of the Raghu Vansa was made into modern Greek and published by Mr. Typaldo, Ephore of the Library at Athens.



the name of *Kālidāsa* strikes no responsive chord : we refer to those called "Young Bengal," and to the *alumni* of English Colleges : we quote the sentiments of a native writer in an able paper on the Dramatic Literature of the Hindus, published in the Calcutta Literary Chronicle. "While the Hindu youth should enrich his fancy with Shakspeare's images, and strengthen his intellect by Bacon's aphorisms, it runs to his scandal, that he should neglect the language and literature of his own country. The most advanced students in English literature have evinced a profound ignorance of Hindu poetry and science, and some have added to the faults of negligence and inattention, the crimes of misrepresentation and caricature."

We now proceed to our analysis of the *Raghu Vansa* ; we shall adhere as closely as possible to the mould of expression of the original :—

The subject of this poem treats of the race of Raghu who duly kept the sacred fire,\* collected wealth for the sake of distributing it, and sought marriage solely to obtain offspring : let the good who are arbiters of vice and virtue, as fire is of gold, deign to hear the account. From Vaivasvata the seventh of Manu's line, the first of kings, as *Om* is first of words, sprang Dilip, the moon to kings as is the moon to the milky sea, with breast like a bull and arms like the *sālā*'s boughs ; yet his intelligence equalled his physical strength ; he was the subject both of awe and admiration to his subjects. Dreaded yet loved, like ocean's depths at once with pearls and monsters filled. 'Twas for his people's good alone his royal revenues were collected as the sun drinks earth's moisture up to pour it back a thousand-fold.

He preserved his power by two means. With a mind much versed in the holy books, and his good old age occupied in learning and devotion, old age came on him without decay. He was the father of the people : their natural fathers only gave them birth : robbery existed only as a tale that is told : a distinguished man, though a foe, was prized by him as medicine is by a sick man, while he rejected a bad man, though a relative, as a finger bit by a serpent. Earth girdled by its ocean fine he governed as a town.

\* The *Agnihoma* or oblation of fire is not observed now in any part of Bengal : Raja Krishna Ray of Nuddea was the last we have heard of who engaged in it. It was one of those links which probably connected primitive Hinduism with the Sabrean system of Persia.



But Sudakhinā, his consort, of the royal line of Magadha, was greatly beloved; the king, however, mounted on the chariot of desire, longed to have another self produced from her. In order to obtain a son therefore, he laid the burden of his state affairs on the shoulders of his ministers, and accompanied by his queen proceeded to the hermitage of Vashishta. Blessings were poured upon them from the towns which they had ruled, the old herdsmen came with their presents of fresh butter, while the royal pair questioned them on the names of the trees which lined the roads. They moved in spotless beauty as the moon with Chitrā, beaming in a pure and cloudless heaven.

\* O'er them played the blissful breezes, breathing Shāla's odours round,  
Fell the fragrant flower-dust o'er them, danced the rows of forest trees :  
Pleased they heard the peacocks' voices, shrill resounding on the way,  
Still, as rolled the sounding chariot, lifting up their heads to gaze :  
Steadfast on the chariot looking pairs of antelopes they saw,  
In whose large and glossy eyeballs mirrored they themselves appeared,  
In a line the cranes were flying, gently murmuring overhead  
Like an arch enwreath'd with garlands, baseless, hanging in the sky,  
Softly swept the breezes with them, ominous of good success.

The king beguiled the journey in pointing out different objects to his spouse, and in the evening arrived at the hermitage, where holy Rishis were piling wood and fruit and kusā grass, which they brought from the forest's depths; the entrance was thronged with deer ruminating as familiarly as if they had been the Rishis' children: while the Muni's daughters watered the trees speedily, lest their presence should scare away the birds.

" By the sacred offerings, odour, and the smoke the breeze conveyed,  
From the holy fire there blazing, they were purified anon."

The royal pair clasped the Muni's feet, and received a blessing. The king then proceeded to state the sources of his grief, through want of a son.

\* These lines are from a Metrical translation of the 1st book made by the Rev. J. Mitchell, one of the few Missionaries in India who have any acquaintance with Sanskrit, a language which is the keystone to the Hindu religion and usages, the knowledge of which gives weight to Europeans among natives, and which is the parent of the chief Indian Vernaculars and the fount for technical terms.



Yet what is Earth to me with all its lovely isles, its precious gems,  
When never from thy daughter here, a child—another self—has sprung.  
The Manes of my fathers see the Shraddhá's offering must expire ;  
Scarce can they now partake, but turn in sorrow from the sacred cake,  
And all the holy water too, which I have poured, must cease to flow :  
Foreseeing this they drink it now, all tepid by their woeful sighs."

The Rishi having heard, remained fixed for a short time in meditation,—still as a lake in which the fishes enjoy the repose of sleep,—and thus replied : Thou wert once returning home to thy wife after worshipping Indra and seeing Surábhi resting under the shade of the *Kalpataru*, thou didst not pay her honour due ; on this she pronounced a curse, "Be without offspring until you learn to respect mine." The curse was not heard by thee owing to the noise made by the elephants splashing in the waters of the heavenly Ganges, thou canst not now see Surábhi as she dwells in Pátála guarded by fierce serpents, but respect her offspring as her substitute. As he finished, *Kámadhenu*\* the offspring of Surábhi made her appearance emerging from the forest depths, when called by name.

' Brown was her hue, all beautiful, soft, polished, like the freshest spray ;  
Gleamed on her forehead a white mark, as the new moon in twilight gleams."  
"The dust excited by her hoofs the body of the monarch touched,  
And gave a purity as if the king had bathed in holiest spot.†

The king was directed to conciliate Surábhi in every possible way.

Move onwards, when she moves : whene'er she rests, rest thou beside her there ;  
Recline, when she is pleased to couch : drink, wheresoe'er thou seest her drink,  
And to the border of the wood, let thy queen also follow her,  
With punctual care, at noon : and so, still meet her in the eventide.

The king and queen soon after retired to repose in a hut of leaves where Kusá grass bestrewed the floor.

At early dawn the cow proceeded to the forest, the queen followed her

\* *Kámadhenu* the cow of plenty : like "the wishing cap" of fairy tales, she could give whatever was asked.

† This reminds one of the Mohammedan notions, that if water is not at hand to perform an oblation, sand will suffice, just as the Hindus burn their dead on the banks of the old Ganges near Baripur to the South of Calcutta though there is not a drop of water in the ancient bed.



track, the dust of which was consecrated by her hoofs, as the Smriti follows the Vedas, so the lord of the earth, having his hair fastened with braids made from creeping plants, followed the cow like a shadow, stopping where she stopped, sitting where she sat, fetching water for her, presenting her with wisps of grass and guarding her from noxious flies : at his approach the trees joined in acclamation mingled with the songs of birds ; the tender creeping plants waving in the wind shed flowers on him ; the deer beheld him without dismay : the woodland gods sang his praise in reeds inflated by the wind in their shady recesses : while the breeze charged with the odour of the waving trees and moistened by the drops of water from the mountains, breathed on him in a refreshing stream : the flowers sprang up at his feet, while the beasts of the forest abandoned their ferocity. At sunset the cow returned, the Rájá following behind, like works accompanying faith ; the lands were gradually becoming shrouded in darkness, while herds of boars ascended from the jheels, peacocks were looking for their aerial nests, and stags were assembling on the grassy meads. The queen drank in with eager eye the approach of the king, while the cow shone between both as day mid morn and night. Thrice seven days thus passed in attendance on the cow : one day as she was browsing near Gánga's banks, a ravening lion sprang from a cavern's mouth and carried her off. The moanings of the cow drew the attention of the king, who immediately bent his bow, but his right hand remained as immoveable, as if it had been a mere picture. Though obstructed in his efforts the king's wrath burned as fierce within, as that of a snake whose poisonous power is restrained by incantations and herbs. The lion then addressed the banner of the line of Manu in these words : " Protector of the earth, vain is thy effort, the wind can uproot the forest trees, but cannot move the mountain top. I am Kumbhodara, you see the Devadáru tree before you which was once adopted by S'iva, but her bark being once rubbed by an elephant's forehead, I have been transformed into a lion in order to scare away wild elephants." The king offered to satisfy the cravings of the lion's hunger by giving his own body, provided he would release the cow, but this the lion with teeth glistening so bright as to disperse the darkness of the cavern, firmly refused, saying, O Lord of animals, it is far better that one cow should be slain than that the



father of his people should perish. The mountain also by the echo from its hollow caverns responded to the same opinion, but the ruler of earth moved by the wistful looks of the cow, answered her thus : as a protector from death, the *Khshatrya* won his high name through the world, what has he then to do with life when his soul is tarnished by dishonour ? if you wish not to slay me, yet have regard to my fame ; so saying he presented his body as an offering to the lion ; at that instant the *Vidyádhara*s from the skies rained flowers on the guardian of his subjects as with averted face he awaited the onset of the lion, and a voice sweet as nectar said, Arise, my child ; he saw only the cow before him who said, I have tried thy mercy and fidelity by the spectral appearance of a lion, mention now thy wishes. With clasped hands the monarch replied : Grant me a son, the propagator of my race and endowed with immortal fame. The cow assented, and directed him to drink her milk from a leafy vessel. The king of kings with face radiant as the moon returned to the hermit's cave and to his spouse communicated all concerning the proffered favours. In obedience to Vashishta's order he drank the milk left by the calf ; after the performance of the sacrifice to their own capital they returned on the morrow's dawn, having previously paid reverential salutation by an oblation to Agni and Arundhati, the calf and cow. As they sped on their way, their ears were soothed by the sound of the chariot as it proceeded in its course ; with waving banners the citizens joyfully welcomed them, their eyes drinking eagerly of bliss in beholding the king with body emaciated from desire of offspring, who appeared to his subjects as the rising moon, the monarch of the herbs. The queen soon conceived to the joy of her subjects.

*Sudakshinā* gave signs of pregnancy joyful to her husband as the face of the rising moon to friends ; with features pale as the *lodhra* tree, she appeared as night on the approach of morn, when the moon gives a sickly ray and the stars can be numbered in the sky ; all her longings were gratified by the monarch of Aude, who regarded his wife in her pregnant state like the Sami tree charged with hidden fire or the stream of Saraswatī, which winds its way beneath earth's surface ; she increased in size like the heaven charged with clouds ready to burst in fertilizing showers. On the birth of a son the celestial quarters shone with auspicious light, the gales



wafted a sweet fragrance, the fire in waving flames towards the right consumed the holocaust, while all things boded felicity on the birth of one who was to be the deliverer of the world. With eyes immoveable as the lotus sheltered from the breeze, the lord of the world drank rapture from the face so fair of his son, nor could he control himself any more than ocean's massy waves on seeing the queen of night the moon.\* The natal ceremonies being finished by an anchorite brought from the sacred wood, Dilip's son shone out as a gem dug from the stone, with radiance issuing from the polisher's hand: a general gaol delivery was proclaimed: he named him Raghu signifying he should go to the conclusion of the Vedas, and the despatching of the enemies.†

After the ceremony of the tonsure, Raghu entered by a knowledge of letters as through the mouth of a river into the ocean of words; as the sun with his horses swift as wind passes through the regions of air, so he passed through the four sciences of Logic, Ethics, History and the Vedas.‡ He was soon married and the king relieved his shoulders of some of the burthen of state affairs by making him co-ruler. One day while making a sacrifice of a hundred horses, Indra carried off the horse by the power of Nandini. Raghu acquired the faculty of seeing invisible things, and he immediately recognised by his hundred eyes unblinking, and his green steeds, that the spoiler was Indra, he addressed him on the evil he had done, but Indra replied that he alone was entitled to sacrifice one hundred horses. On this a battle fierce ensued, arrows flying about in all directions horrid as the view of serpents winged. Indra with his shower of arrows tried to kill him, but as vain as the cloud by its waters strives to extinguish the lightning which has issued from its bosom. The combat lasted long, and Indra admiring his valour promised to give him whatever he would ask except the horse. Raghu returned home. Dilip determined to ascend to heaven on a ladder made from the merits of his ninety-

\* This seems to imply some knowledge of the laws of attraction. A similar passage occurs in the Raj Tarangini. When we consider the mode in which the mysteries of knowledge were shrouded from the vulgar eye in ancient times, it is not improbable the law of gravitation may have been one of those known to the priests.

† Respecting the naming of children, see Manu II. 30.

‡ Like the *quadrivium* of the middle ages.



nine sacrifices, therefore recalling his mind from sensible objects, he delivered the white umbrella to his son and according to the vows of the family of Iksháku, when the days of youth melt away, he entered with his wife the forest shades where holy Munis dwell.

Raghu in possession of his paternal throne shone illustrious, as at the close of day does fire receiving the rays deposited by the solar orb; when the kings heard that he had been established on the throne; the fire of affection before wrapped in smoke, burst forth into flames: now Lakshmí canopied him with her lotus-made umbrella. The citizens rejoiced in his advent as if Indra's banner had been unfurled: he was a general favourite on account of the justice of his punishments, equable as the south breezes, neither hot nor cold. As in possession of the Sakakár (a fragrant mango) the loss of flowers remains unfelt, so did the citizens' regret towards the sire. Raghu though gifted with an acute power of vision from eyes which stretched towards the ears, yet possessed still greater from books, which indicated things the most minute. On his countenance lighted up with a glow of kindness men gazed as on the full orb'd moon, while his beauty surpassed autumn with its lotus-shades and fans of budding grass. Women reclining under the sugar-cane's shade sang his praises, commencing with his natal time. As tranquil moves the ocean after Agastyá's rise, so trembled the enemies on the appearance of Raghu.

Autumn rendering the rivers fordable and drying up the muddy paths, incited him to undertake an expedition. The waving flames on the right, arising from the sacrificial lustration of horses, as if with outstretched hand, presented to him victory. Raghu, having then fortified his city, set out with veteran troops on the conqueror's route. On beholding him the city matrons besprinkled him with grain as the drops of water from the milky ocean fall on Vishnu, raised by the power of Mandára Mount. Like Indra, his first march was towards the East, daunting the enemy with banners waving in the wind; with the dust of his chariots and his cloudlike elephants he blended earth's soil with the sky; the barren deserts flowed with streams, the rivers gave way as with his mighty troops he moved to the East, like Bhagiratha conducting Gánga's stream from S'iva's head. As by the march of elephants the trees lay strewed and scattered all around, so lay the monarchs whom he encountered in his route; conquering all the



Eastern regions, he arrived on the shores of the mighty ocean darkling with the palm trees' shade. The Suhmi bending to the conqueror as reeds to the torrent's fury, escaped destruction. Having conquered the Bengalis who trusted in their ships, he erected pillars of victory on the islands of the Ganges.

Having passed the Kapisá river by elephants, under the guidance of the people of Utkál (Orissa) Raghu arrived at Kalinga. Mount Mahendra received from him a shock, as from the Mahut's goad the stubborn elephant's head. Kalingá's monarch mighty in elephants in vain attacked Raghu, like Indra attempting to cut his wings. The soldiers decorating the place with betel leaves, toasted their success in wine of Nálikera; but Raghu desiring victory only for the sake of justice took possession of no land. Then to Agastya's land he marched skirting the shore, fringed with fruitful betel palms. The soldiers occupied the plain to the foot of the Malaya hills where doves flit in spicy groves. The elephants had their temples fragrant from the dust of sandal wood which they had raised in their march. The Pandu kings rendered homage to Raghu by gems collected from the ocean's bed where Tamráparna rolls its waves. Having refreshed himself near the shore on the Malaya and Dardura sandal-covered hills, the paps of earth, he lined with troops the Sabya hill, from which ocean had retired far and left earth's bosom bare; the soldiers then marched on to subdue the Western people. The dust from the Ketak tree raised by the winds from the Mural river served to polish the soldier's armour, the tinkling coats of mail drowned the sound of the betel trees agitated by the wind. Old ocean retired at Ram's request, but to Raghu she gave as her tribute dominion over Western kings. The Trikuta mount cut by the tusks of maddened elephants afforded victory pillars.

In his battle with the Western people he could only recognise the enemy by the twang of the horny bow, so dense the dust lay round. The bearded heads strewed thick the ground. In vineyards fair the soldiers wearied with warfare refreshed themselves with wine. To the region of Kuvera the monarch proceeded; he carried off the people by his arrows which dispersed them as rapidly as the sun the water by his rays. His horses refreshed themselves on the banks of the Sindhu; the people of Kamboj were as little able to stand his charge in battle



as the *Akshodh* trees to resist the elephant's mighty force. Raghu ascended the summits of Gauri's parent (Himalaya) which seemed loftier from the clouds of dust raised by the march of his troops; the winds whispering through the reeds, wafted drops of Ganges water: the herbage at night by its brilliancy served the soldiers instead of lamps. In Raghu's battle with the mountain tribes fire flashed from the concussion of spears and arrow-heads. Raghu passed by Lauhitya, the lord of the *Pragjyotish* trembled, he then proceeded thence to Kámarup, the Rájá of which presented him with elephants and laid oblations of gems at his feet. On his return the dust of chariot wheels fell on captive kings umbrella-less, he distributed all his wealth among the Bráhmans; as the good, like clouds, only receive to give again.

By him whose age succeeded to childhood, the night was spent sleepless, anxious to possess that gem of a girl: early in the morning he was roused by the songs of the *Vaitálíka* chaunting "Oh king, fair as the moon, the moon is setting; yonder the sun arises, expand your pupils which move so beautiful in the eyes, as the bee amid the lotus flower of lovely eyelids fair. Aja rises and dressed in suitable costume he entered the Hall of Election.

Aja entered the assembly of kings, brilliant as forked lightning amid a range of resplendant clouds, or as the Kalpa Druma among the lesser trees of paradise, the eyes of all were fixed on him. Immediately after amid lines of monarchs of the solar and lunar race, with clouds of waving incense and the clang of trumpets—entered the bride in her four-wheeled chariot in nuptial vest arrayed; on her, the fairest of Bráhma's creatures, the minds of one hundred kings were fixed, their bodies alone remained on their thrones.

Then Sunandá, guardian of the Antapura, in manly accents introduced to Indumati the king of Magadh, "Protector of the poor, the justest king on earth, as night, though fair with thousand stars, by luna only is illuminated, a perpetual worshipper of Indra. If O Queen, you give him your hand, you will present an oblation of joy to the eyes of the ladies of Pushpapura, sitting to gaze at you from the windows of the palace." But without words, by a nod with unbent body, the Virgin, from whose head the faded chaplet of Madhuka had fallen, to him refusal gave. Then the holder of the cane, as the wavy line of water



raised by wind bears the swan in Mánasa lake to another lotus, conducted the royal maid to another unsuccessful suitor, the king of Anga, famed among the immortals for his beauty, whose elephants were tamed by men who have written a code of instructions on the subject.

Next came, bright as the risen moon, Avanti's lord, of long arms broad chest and slender waist, noted for the line of kings that followed in his conquering train. He like the sun on lotus flowers shed the rays of his favours on his friends, but withering looks he gave to his enemies as the sun dries up the muddy lake. To him succeeded the king of Anurupa Kártavirjya the conqueror of Rávana, but he was as little acceptable to the maid as in autumnal time the lunar orb to lotus beds. Him followed the king of Srusena, the abode of virtue; in his house his beauty was as pleasing as the lunar beams to the eyes, but as a river in its flow to the ocean passes by the mountain in its course, so the royal maid passed over the Rájá.

Him followed Kalingá's monarch, lord of Mahendra, whose arms retain the traces of the twanging bow, a dweller on the ocean where the dashing waves, louder than the trumpet sounding the hours, gleaming through the windows, awake from sleep; the shore resounds with the rustle of palm leaves, while from other isles the winds waft the fragrance of the groves of clove—he was rejected. Next came Pándu's king with garlands decked of yellow sandal leaves, as Himálaya, king of mountains, tinged with the rays of the rising sun, but he made no more impression on the maid than the lunar ray on lotus leaves, unclosed, save when the sun appears.

When the torch of the maid's presence was held up to a suitor, he was cheered, but on her passing by he sunk again into the darkness of despair. As she came to Raghu's son, he stood in suspense which was soon removed by the agitation of her right hand. As bees once lighting on the *Sahakár* tree desire no other, so the maid allowed no other monarchs to approach. Sunandá now announced the ancestry of Aja, "Sprung from Dilip, the light of his race: during his reign there was such security that not even the breeze would disturb the garments of a woman sleeping on the high road, much less would a man extend a hand of violence: his son Raghu gave away for religious objects all his store of wealth having only earthen vessels left, his glory reached the skies and ocean's deep recesses, from him is Aja sprung, a suitable



match for you : let the diamond be joined with gold." The maid, her countenance radiant with love, as with the bridal garland accepted the youth ; unable to speak, her wishes were expressed by the erection of her hair through pleasure ; on the youth's neck she placed the yellow garland fair. " Behold the rains of the lunar orb joined with the moon free from clouds. Behold Gánga mixed with the ocean, receptacle of waters ;" such exclamations burst from all the citizens. On one side stood the joyful friends of the bridegroom, on the other the gloomy circle of kings, the assembly resembled a lake where at early dawn the lotus blooms, while the waterlilies are buried in slumber.

The royal pair entered the streets of Vidarbha which were strewed with branches of trees and shaded from the heat by martial banners. The women having left their other occupations, crowded to the windows to gaze, all their senses were concentrated in the eye ; Bhoja Rájá of Vidarbha having handed down Aja from an elephant, conducted him into the house, and seated him on a throne, loaded him with diamonds, the *Argha* and *Madhuparka*, a pair of silken garments, which having put on, Aja went to Indumati, drawn as is the ocean's wave to shore, by the influence of the lunar orb. Then the priest of Bhoja, having offered ghi and other things to Agni, which he made a witness, united the pair in wedlock. The bride of partridge eyes cast grains into the flames, from which a wreath of smoke arose encircling her ears as with a garland fair. The royal pair mounted on a golden seat were sprinkled with moistened grains by heads of families and aged matrons. The rejected kings hiding their wrath under the guise of joy, resembled a tranquil lake beneath whose surface alligators lurk. Bhoja Rájá accompanied Aja for three days and then returned. The rejected kings then anxious to carry off the jewel bride, beset king Aja's way, who received the attack of his royal foes as Sone with swelling waves mingles with Bhagirathi's stream ; then foot met foot, horse horse, and chariot chariot, each engaged in single combat. The lineage of the combatants could not be heard by the trumpeter's voice, but written on the arrows they were announced to the foe.

Clouds of dust wrapped in a veil the sun ; fish-emblazoned banners imbibing this dust appeared as real fishes drinking turbid water. In this darkness arising from dust obstructing the path of the eyes, the blood flowing from the wounds of horses, men and elephants, which resembled



the solar orb newly risen. The heads cut off by arrows appeared as fruits cut from the stalks; the fallen helmets strewed the ground as cups with blood bedewed, the battle field appeared a banquet of the dead. Host encountered host, like ocean's swelling waves impelled by winds in front and rear; as smoke dispelled by wind, so fled the troops of Aja Rájá, but he stood firm as a fire inkindled, checking the band of kings as a mighty boar the ocean's flood in the Kalpa Yuga. With royal heads he strewed the ground whose lips in anger bit retained a reddened flush. His car with weapons pierced, he was only to be known by its top, as the dawn of day on a morning when the solar orb has just arisen. Applying shell to mouth Aja blew the blast of victory; his coward soldiers heard the sound of the Rájá who appeared among conquered kings as the moon glittering in the midst of sleeping lotuses. With arrows dipped in royal blood Aja wrote on the banners of the conquered foe: "To-day by Raghu's son ye are bereft of glory, but through his clemency not of life." Indumati's countenance freed from fear of the enemy resumed its wonted brightness, as a mirror when the vapour of the breath has passed away; though full of joy, yet overcome with shame, she addressed not her beloved herself, but through the voice of friends, as the earth watered with recent rain addresses the clouds through the cry of peacocks. Aja placing his left foot on the necks of the kings, led away his bride to receive the salutation of Raghu, who then retired to the forest; for those of the solar race when they find a prop to their family, no more remain in domestic life.

Then Raghu to his son who wore the marriage thread, delivered up the earth. Aja's piety and military spirit united, resembled fire and wind conjoined; the long-armed king as a new wedded bride enjoyed the rule of earth. Each citizen thought himself the special object of the monarch's love, none felt himself neglected, as ocean receives within his embrace a hundred rivers. In moderation neither too strict nor too soft, he governed other kings, as breezes bend the trees, but do not eradicate them. Raghu like Dilip's sons, designed, in dress of bark arrayed, to seek the hermits' cooling shades, but Aja with pearl encircled crown entreated him to desist; but as a serpent his slough resumes not again, so he his regal power; entering the fourth order he dwelt with senses subdued without the city's walls, his sun had set



and Aja's risen in the firmament. Aja to re-acquire an invincible kingdom associated himself with ministers skilled in politics ; Raghu to attain a kingdom undecaying in the skies united himself to holy men. The one to look after the welfare of his subjects occupied the seat of judgment, the other to devote himself to meditation occupied the seat purified by kusa grass. The one by his power reduced kings beneath his sway, the other by meditative power subdued the five airs of his body. Aja exercised the six royal qualities Sandhi, bigraha, jána, ásanna, daidhya, áshray ; Raghu achieved the three qualities, satya, raja, tama, and esteemed gold equal to clay. Raghu thus passed a few years viewing terrestrial things with indifferent gaze until by the force of sacred meditation he attained to the Supreme Purusha (Spirit) dwelling beyond darkness ; his son paid the last rites to his remains which were interred.\* Shortly after this was born Das'aratha, bright as the sun, the father of Ráma. Aja when by the study of the Vedas, by sacrifice, and a son, he had discharged his debts to the Rishis, Gods and Pitris, shone forth as the rays of the sun free from eclipse ; he used his power to free the wretched from fear ; not merely his wealth but his virtues were at the service of others. As Indumatí walked with her husband in a grove, she fell dead on the spot. The husband clasping to his bosom his lifeless spouse appeared as the moon at morning tide covered with spots, as iron becomes soft by heat, so lost he his native courage and made the following lament :  
 ' A garland soft my wife has killed, thus death destroys the soft by soft : as I have seen the lotus killed by liquid snow ! Why, without bidding me farewell, have you departed into another world from whence you will not return ? not as yet has the perspiration from my embrace been dried up from your forehead, and thou art dead, alas ! the unsubstantial nature of the body ; thy speechless face covered with dishevelled locks, torments me like the solitary lotus sleeping at night in which the bee has ceased its hum. Oh beloved, awake and dispel my sorrow, as the plant the midnight darkness of the caverns in the Himálayan mount ; the wind waving thy locks entwined with flowers, casts on my mind

\* The Hindu notion is to burn the bodies of ordinary persons as fire is considered to purify them, but the corpses of Yogis or devotees are not burnt as being considered purified already.



a hope of thy return. Night after its separation returns to the moon, its mate to the Chakraváka, but thou wilt never return, thy tender limbs were hurt reclined on a bed of freshly gathered leaves, how will they bear the funeral pyre? Thy lively voice thou hast left behind with the kokils, thy amorous gait with the swans, thy trembling looks with the stags, thy mirthful gestures on the plants gently agitated by the wind. Thou hadst resolved to unite in wedlock the Sahakár and Priyanga trees,\* but thou hast departed without completing the ceremony. The Asoka tree pouring forth its leaves like flowers, remembers the pressure of thy feet. Pleasure has departed, the song has ceased, the seasons are without song, the need of song has ceased and my bed is deserted. O wife of my house, companion, friend and loved pupil in song, what has not been snatched away by death which has taken you away, all my pleasures were seated in thee alone!

The king with his lament caused even the trees to shed their resinous tears. His spouse was torn from his embrace and committed to the pyre made of agallochum and sandal. Having performed after ten days the obsequies of her of whom nothing was left except her virtues, he entered the city without her, fading as the face of the moon when night departs. The goad of sorrow tore his heart as tears the temple's court the fig tree's branch. Having instructed his son Das'aratha in the duties of empire he determined to deliver himself by starvation from the habitation of his body, afflicted with disease, on the confluence of the Ganges and Sarayu, where he was numbered among the immortals having rejoined his loved spouse fairer than in life.

On the death of his father, Das'aratha, the conqueror of his senses by meditation, borne in his mighty car, assumed the reins of government. From his rewarding labour at a suitable time, he received from the wise the title of the destroyer of fatigue. In his land disease fixed not its foot, it afforded richest fruits, bright as the immortals. In his equity, in raining down riches, and restraining the wicked he

\* It is a custom among the Hindus to plant the five trees Asvat, Bat, Jayanti, Asoká, Svami in a circle, and to make offerings to them, as they consider that as long as these trees remain so long the offerer will remain in heaven. There is now a law suit pending in one of our courts in consequence of one of these trees having been mutilated.



rivalled Káma, Kuvera and Varuna, and the sun in splendour.\* Neither the delight of hunting, or gambling, or wine sweet as the lunar rays, withdrew him from business. Towards transgressors his heart was of iron. He conquered the ocean, whose waves like drums resound in lofty sounds the tidings of his victories. Hundreds of captive monarchs in their prostration illuminated his feet with the diamond rays that flashed from their diadems which dispersed them as rapidly as "Sol the water by his rays." His horses refreshed themselves on the banks of the Sindhu; the people of Kamboj were as little able to stand his charge in battle as the *Akshodh* tree to resist the elephant's mighty force. The descendant of Raghu ascended the summits of Gauri's parent (Himálaya) which seemed loftier from the clouds of dust raised by the march of his troops; the winds whispering through the reeds wafted drops of Ganges water: the herbage at night by its brilliancy served the soldiers instead of lamps. In his battle with the mountain tribes, fire flashed from the concussion of spears and arrow heads. At the close of the sacrifice he soothed the *Khetriyas*, grieved at the great slaughter, by giving them high honours and allowed them to return to their wives languishing after long absence, the *Khetriyas* having prostrated themselves at the feet of the king, not to be touched, but as an act of grace, proceeded to their homes.

But Das'aratha amid all prosperity did not enjoy that light called a son, which destroys the darkness of sorrow; in expectation long he dwelt like ocean before its churning, the production of gems not having yet taken place; as travellers tired with heat seek the shelter of a shady tree, so resorted the gods, vexed by Rávana, to Vishnu, who sat with eyes like the opening lotus, with garb dyed in the rays of the rising sun, like an autumnal morning soothing to the eye. With eyes brilliant after the slumber of religious abstraction had been over, Bhrigu and the other Rishis in songs of praise addressed the conqueror of the Asurs:—"Hail in the threefold form of creation, preservation, and destruction. As celestial water which has only one taste

\* It is singular how a radiant light has been associated by the writers of antiquity with the bodies of illustrious men, here with Das'aratha. The Arabic writers connected a brilliant light with Muhammad.

Scripture states that the bodies of the righteous shall shine in heaven like the sun.



assumes others in different localities, so thou, unchanged in different qualities, takest different states. Immeasurable yet measuring the world, free from desire yet imparting it, unconquered yet conqueror, unmanifested yet the source of all external manifestation. Of one form yet vested with various, like the variation of crystal owing to superadded colour: dwelling in the heart yet not near, old yet not growing old: omniscient, yet not known, the home of all things yet self-existent: ruler of all, subject to no ruler: one, yet of multiplied forms: praised in seven hymns, sleeping on the waters of the seven oceans, whose mouths of fire shining with seven fires are the refuge of the seven worlds. The ways that lead to bliss though in books diverse yet in thee converge as Ganges' streams in the ocean's waves. As gems are more valuable than the ocean, as its effulgence is brighter than the sun, so are thy deeds far superior to praise."

The gods declared the danger impending from a Rákhasa as from ocean threatening in a deluge to inundate its shores. To this Vishṇu, whose voice drowns the roar of ocean proceeding from the caves of the mountains adjacent to the shore, replied—I know the three worlds are oppressed by this Rákhasa, but through the favour conferred on him by his Creator his violence is tolerated by me as is that of the sandal-wood by the snake, but I shall become incarnate as the son of Das'aratha, and shall cut off his head like lotus tops in the field of battle—wherefore let the holy souls who in the fields of air beholding his chariot, wished to hide themselves in clouds, now cease their fear. On these nectarious words, the fruits of the gods, withered by the dryness of Ravana, became moist; the gods followed Vishṇu as the trees the wind along the flowers.

For the attainment of his wishes Das'aratha the ruler of men performed once a sacrifice; from its fire proceeded an awful form which spoke these words:—

"At the due time a son, dispersing darkness as the herbs the gloom of night and the mountain darkness, will be born." The father seeing his fair body gave him the name of Ráma, a sign, that by the light of his fame he will illuminate Raghu's family, by his splendour the lights in the lying-in chamber were paled.

His mother became thin, as the Ganges stream is feeble in autumn after its swelling torrents.



At this time also Bharata was born, the ornament of his mother as moderation is of prosperity. Sumitrá also gave birth to twins as the cultivated knowledge is the parent of wisdom and humility. On the birth of Ráma all the kings in terror of Rávana breathed as through an atmosphere free from dust. The fire was darkened by no smoke and the sun shone in his splendour : flowers were rained from the heavenly tree : as the consecrated ghi swells the sacrificial flame, so was Ráma and Lakshman's natural modesty, increased by instruction, united in love, as the wind and fire, the ocean and the moon. Refreshing as are at the close of the hot season days dark with clouds, so cheered they the minds of their subjects, they soothed their father by their virtue as ocean with its gems consoles the Lord of the world.

At the request of Vishvámित्रa Ráma and Lakshmana were granted to him to remove the hinderances to performing the sacrifices ; as they moved on their way equipped with bows, the clouds rained flowers, the fatigues of the journey were relieved by words of ancient days, amid the songs of birds and fragrance from the dust of flowers. The Rákhasí *Tádaká*, of a colour black as midnight, having human skulls as earrings and dead men's clothes as a robe, quick as a wind from a cemetery, commenced an attack, having dead men's intestines wound round her legs ; but an arrow from Ráma soon despatched her to the dwelling of the lord of life. The prophet Vishvámित्रa gave to Ráma then a dart powerful by *mantras* to kill demons, as the diamond receives from the sun a lustre powerful to kindle wood. After this entering a forest whose trees joined their branches like hands together, the brothers protected the seer from danger, as the sun and moon the earth from darkness. Rákhasas disturbed the sacrifices, Ráma with his bow prostrated the son of *Tádaka* ; though heavy as a rock, he fell like a fading leaf ; Janaka, king of Mithilá on this invited them all to Mithilá. On the way the sin-destroying dust of Ráma restored the wife of Gautama. Janaka was surprised that the beardless Ráma designed to draw his bow, yet he believed him possessed of power as the flame, though little as the firefly, gives the power of ignition. The hands of attendants like masses of clouds brought the splendid bow, which though hard as a rock was bent by Ráma as easily as Káma Deva bends his bow of flowers ; to him as a reward for his strength Janaka delivered his daughter.



Das'aratha leading troops whose dust snatched away the solar rays, beset the city in friendly bands, the marriage of men and women took place like the union of a crude noun with its suffixes. Das'aratha returned on the march, the winds blowing against his soldiers, tree-like banners disturbed them as a river bursting its banks the plain, the sun was wrapped in a halo, the clouds of evening were red like garments dipped in blood, the wolves sent forth a horrid howl,—omens disregarded. Before them an awful form appeared wearing the *paita*, a sign of his father being a Bráhmaṇ, and bearing the bow, the sign of his mother being a *Khetriya*, the union of the two resembled that of sandal-wood with a snake. On his right ear he wore a necklace of *aksha* seeds. To Das'aratha the name of Ráma and Parasuráma suggested joy and terror as that of a necklace of gems and the serpent's gem. Parasuráma thus addressed Ráma, "as a sleeping serpent is roused by the blow of a stick so is my anger by your fame: the horn of my strength is broken by your bending Janaka's bow: the greatness of fire is tested by its burning in the ocean as in dry grass, therefore bend my bow." Him answered Ráma by bending the bow—on this the splendour of his face paled, as the sun at evening in the time of full moon, while Ráma brightened as the lunar orb, but Ráma pardoned him, for the brave respect merit even in a vanquished foe. Grateful as is the fall of rain to a tree on fire, so was the victory of Ráma to his father who received him as it were again to life. Then the lord of the earth having stopped some nights in serais, on the road entered Ayodhya, whose women from their windows gazed with lotus-eyes on the daughter of Janaka.

Das'aratha was near the period of his bodily extinction, like the light of a lamp at the morning dawn: old age in the guise of grey hairs whispered into his ears, Deliver your office to Ráma. The bare rumour of this rejoiced the citizens as much as a water course does the garden plants, but Kaikaleya according to promise required Ráma's exile for fourteen years: Ráma submitted, the colour of his face remained the same in his dress of bark as in his festal garb; with Sitá and Lakshmana he entered at the same time the *Dandaka* forest and the heart of every true man. Das'aratha went to heaven. Bhárata went to Ráma who had been married to the throne, who refused to return but by request gave to Bharata two slippers as tutelary guardians. Ráma lived on forest food, sometimes reclining under the tree's broad shade in the



two arms of Sitá : but Ráma soon left Chitrákote noted for its cuckoo songsters, and proceeded to the south, dwelling on the way in hermits' cells as the sun in the autumnal signs : his perfumed limbs emitted such an odour as to allure the bees from the flowers. As Ráhu obstructs the moon, so did a Rákhasa, brown as the cloud of evening ; he was soon killed and buried, to prevent his polluting the land with his stench. Ráma remained in *Panchavati* not passing the prescribed limits—a barrier like the Vindhya mount. As a snake tortured with heat draws near to a tree in the Malaya mountains, so did Rávana's sister Surpanaká tortured by love approach to Ráma, even in the presence of Sitá ; for woman's love when strong regards not time. Ráma of bull-like shoulders said, I have a wife, address my brother : she rejected by him again went to Ráma, like a river laving both banks. But the laughter of Sitá swelled her with rage as the rising moon excites ocean's waves lying unruffled by the wind. She said, Your laughter is like the contempt shown by a tigress to the stag : she who before spoke in sweet accents like the cuckoo's voice now sent forth the howl of a she-wolf, and suspended in the air, with fingers armed with crooked nails and thick as a knotty reed, she menaced the brothers with her army of Rákhasas, but from the showers of Ráma's arrows the trunks of the whole slept to rise no more in the shade of vultures. Surpanaka alone escaped to tell the tale to Rávana, who thought the feet of Ráma would soon be on his ten heads ; in the form of a stag he snatched away Sitá. Ráma formed a friendship with the monkey Sugriva for the rescue of Sitá.

In the city of Lanká surrounded by Rákhasas, Hanuman discovered Sitá resembling the sensitive plant surrounded by poisonous herbs. Ráma through love of his wife thought that crossing the ocean to Lanká was only passing a narrow trench. An army of monkeys accompanied him along earth's back, and through the paths of air over the salt waves he threw a bund and besieged the city Lanká, his apes making as it were a second golden wall ; Ráma mounted a chariot, the banner of which was moved by the waters of the celestial Ganges, he grasped the lance of Indra which repelled darts as easily as lotus leaves : the arrow of Ráma piercing Rávana's breast entered the earth as if to bring news pleasing to the snakes ; as a mound between two infuriated enemies so hung the power of victory poised between both. The gods and Asuras



showered on both flowers. A club of *Kutasalmal* furnished with iron nails was hurled at Ráma, but with semi-lunar arrows he cut off this club as quickly as a plantain bud. And at the same time the hope of the Rákhasas, the hundred heads of Rávana were cut off at one blow, presenting the appearance of the sun's image reflected one hundred ways by the flickering waves, a shower of flowers followed by a swarm of bees was poured on the head of Ráma by the gods. Ráma returned to his city.

Vishnu taking the name of Ráma passed through his region (the air) the quality of which is sound, and thus addressed his wife :—" Behold the foaming waters divided by my bridge as the æther (the road of light) in autumn time exhibits the brilliant stars,—ocean is the parent of the solar rays the ministers of fire : like Vishnu its form can be limited neither by number or quantity—in the ocean, are animals which spout torrents of water on high, snakes which rise to inhale the air blowing from the shore and shine with their diamonds reflecting the solar rays—as a brazen line on a chariot wheel, so appears dark with *Tamála* trees the narrow shore of the briny ocean black with ranges of *Tamála* and palm trees. The wind from the shore wafts the fragrance of the *Ketaka*. In our celestial car wafted we arrived at the ocean's shore planted with betelnuts bending under their load of fruit. Oh, thou stag-eyed, the cloud having the lightning as its bracelet becomes your ornament—the bark-clad hermits dwell in the Dandaka forest where the creeping plants by their shoots indicated your abduction,—there is the heaven-touching summit of the Malayan mountain where in your absence I could not endure the scent of the *Kadamba* flowers with half-opened leaves, nor the pleasing screams of the peacocks or the noise of the clouds reaching from their caves, then was I vexed by the beauty of your eyes dark with the smoke of matrimonial flames, then I beheld the ruddy geese inseparable in affection giving to each other the lotus leaves, the tender plants of *Asoka* with flowers pendant as breasts were embraced by me in your absence. Then near the banks of the *Godávári* I returned tired from hunting, refreshed by the wind blowing from the waters, reclining my head on thy bosom I slept in the reedy forests ; there is the river *Mandákina*, with crystal streams which seen at a great distance seems at the foot of the mountain like a string of pearls on the neck of the earth—in this forest are trees which produce fruit without the previous mark of flowers."



After this Ráma alighted from his car on a ladder of crystal. As the moon, the queen of stars mounts the evening clouds distinguished for their gleaming lightning, so did the chief of Raghu's race climb his car marked with a standard floating in the wind. Bharata admired Sitá rescued by Ráma as the departure of the rainy season frees the brightness of the moon from the mass of clouds. Ráma proceeded to the forest near Audhe furnished with tents.

Das'aratha being dead, and Ráma in the woods, their wives lamented, sad as two creeping plants on the tree they clung to being cut, the cold tears of joy were mixed with warm sobs like the streams flowing from the snowy mountains united with the warm current of the Ganges and Sarayu. In water brought in golden vessels the senior counselors finished the inauguration of Ráma which was begun in woman's tears, water was fetched from rivers and lakes which fell on Ráma's head as cloud water on the Vindhya mountains, he entered the city of lofty gates amid showers of moistened grain. Like locks of human hair arose the wavy lines of the smoke of incense burnt in the houses. Sitá shining bright as fire sat beside Ráma who entered the house of his father who survived only in his picture. The past sufferings in the forest afforded in the houses ornamented with pictures only pleasure on the recollection. Sitá with her soft look, and face pale as the *shar* tree, without words, indicated to her lord her pregnancy the source of joy. Ráma at this time mounting his roof which reached the clouds, beheld his city and the citizens delighting in the royal parks. But on hearing from his confidants that his citizens doubted the purity of Sitá, his heart became lacerated as iron struck by an iron club, his mind wavered to and fro,—but glory being preferable to life he preferred repudiating his wife. He stated to his brothers called together, See, said he, the stain cast on me as on a mirror from a cloudy wind, though knowing her to be innocent, yet I feel the slur; men attach a stain to her as they consider the earth's shadow a spot on the moon. His brother conducted Sitá to the forests, little knowing that her husband had been changed from the celestial tree into a tree whose leaves had been paved with swords. When Sitá alighted, her brother-in-law declared Ráma's message weighty as a mighty cloud raining stones. Like a plant smitten with terror as by a wind to the ground, she sighed like a lamb with open mouth—in sympathising sorrow the peacocks ceased



to dance, the trees cast their flowers, and the goats rejected the cropped grass. The hermit who had gone forth to collect sacred grass and flowers beheld her as a bird stricken by the hunter. Válmiki conducted her in the evening to his hermitage where deer reclined and delivered her to holy women—they gave her at the end of the day a tent lightened with a lamp of ingud oil, a sacred skin serving her as a couch. Ráma on hearing of his wife, poured forth tears as the moon does snow in the month of Paus.

The lord of the ocean-encircled land hearing that the Rákhasa Lavana attacked the seers living along the Jumna sent his brother to subdue them. He proceeded through forests laden with flowers breathing sweet odours: the army co-operated with him as in the verb *adhyáyan* the preposition *adhi*. Lakshmana spent a night in the forest shades with Válmiki where Sitá gave birth to twins. The next day appeared Lavana black as smoke, with hairs red as flame, moving among his troops as the blaze of a funeral pile, he wrenched a lofty tree as easily as grass and hurled it at Lakshmana, but it was severed in two by his arrows, while an arrow pierced the giant, he fell, bringing terror to the earth and removing the terror of the hermits; flocks of birds pounced on the dead Rákhasa and showers of flowers fell from heaven on Lakshmana's head which was erect in its strength but low in modesty. After this Lakshmana founded the city Mathurá, from the roofs of which he beheld the Jumna flow by, adorned by the *Chakravákas*, wreathed as hairs of the earth with a golden fillet. Ráma's sons sang the deeds of their father which soothed their mother, the deer listening to the song. A sacrifice was appointed, Kusa and Lava singing the Rámáyana of Válmiki, Ráma and the assembly listened with rapture like a forest district unruffled by the wind, dripping with the dews of morn. Next day Sitá with her two sons came from the hermitage of Válmiki. With gentle mien, clad in red, fixing her eyes on her feet, Sitá came forward and was acquitted, the spectators stood with downcast head bending as stalks of rice laden with fruit. Sitá drinking pure water exclaimed, I am free from this sin and appeal to thee, O earth, to receive me to thyself; so saying a light burnt from a chasm in the ground, the goddess earth appeared and with her she descended to the lower regions. Ráma tried in vain to recover her, but the love he had for Sitá, he now reposed in the sons. Yam



appeared, directing Ráma to enter heaven ; Lakhsmana at this time died on Sarayu's banks, Ráma finding that one-fourth part of him had thus gone to heaven, stood tottering like virtue standing on three feet. At the time of his ascent all *Audhe*, except the houses, proceeded out to see it, his footsteps were bedewed with the tears of the citizens big as the flowers of the Kadamba, regretted by the rayats to whom his kindness had long been great. Kusa, Ráma's son, succeeded him, the other brothers kept within their respective spheres as the ocean within its shores. As Kusá lay one night awake in his bed-chamber, the lamp burning with still flame, he beheld a woman with the shape of a shadow on a mirror, having a countenance of woe.

She announced herself as the tutelary goddess of the city deserted by its ruler of the solar race, in consequence of which the portals fell to ruin like the end of day when the sun sets behind the western hills, and the clouds are scattered by the wind—in the royal paths where wandered once the wanton girls of shining feet, the dogs now hunt for food ; the water which once in the tanks struck by the hands of females gave forth the sound of the lute, now sends out the bellowing of wild oxen ; on the steps once trod by the yellow feet of fair women, the tigresses now place their blood-stained track on the statues of females now faded and covered with dust.

The tiles were so stained from time and covered with seeds as to give no reflection of the moon's rays though bright as gems : wild monkeys pluck the plants formerly cropped by playful girls. The windows exhibiting no splendour of the midnight moon and bereft of the light of woman's face are covered with spiders' webs, while the reed-made huts on the Sarayu's banks are deserted. The king agreed to return to Audhe, a suitable day was chosen, and the soldiers followed him as clouds do the direction of the wind. The army on its march resembled a royal city, the crowds of banners a forest, the elephants mountains, and the chariots palaces, the army shone as the ocean under the reflection of the moon beams moving to shore. The earth unable to bear the weight of the troops mounted in clouds of dust into the æther, the army moved across the Vindhya hills ; the chariot wheels were red from the metals' friction, he passed the Ganges on a bridge made of elephants fastened together. The swans in their aerial circles served the purposes of a goad. Crowds of builders renewed the



face of the city, as the clouds the earth when parched by summer's heat. Summer came prompting the maidens to ornament themselves with jewelled garments and with vests which a breath could blow away. The days of summer heat increased and night was very short, both like husband and wife, who separating after a quarrel are burning in the flames of sorrow.

Kusa and his women entered tents erected on the banks of the Sarayu, the women amused themselves in sporting with the swans and dashing water high which washed off the paint from their limbs, exhibiting diverse colours like the dawn covered with clouds, but their joy of heart restored a colour to their eyes similar to that of the pigment washed away by the water, which by its concussion gave the sound of a drum; on hearing which the sweetly singing peacocks expanded their tails, the Rája sported with them in the water as a wild elephant does amid the lotus flowers, in contact with the king; the women shone more brilliantly, like ordinary gems with an emerald. But while bathing the Rája lost the bracelet, the pledge of victory given to him by his father Ráma. The fishermen searched in vain and with countenances languid as the lotus gave to him the news, but to Kusa the hook of the enemies this was soon restored: amid the rain of flowers Kusa married Kumadvatí of the serpent race.

By Kumadvatí a son Atithi was born, fair as the moon towards the dawn of day. Kusa, his father, by having a son endowed with equal good qualities as himself multiplied himself. Preparations were made for the son's inauguration as King: the sweet and deep-toned clang of the musical instruments gave presage of the happiness of his reign, the lustral ceremonies were performed by the scattering *durvá* grass, barley stems, the bark of the fig and lotus calices—the Bráhmaṇs moved in procession singing triumphal songs while water from the Ganges was poured on his head in streams. The King elated with the praises of the heralds seemed like a great cloud hailed by the *chátaka* birds; as the splendour of fire sprinkled by rain is increased, so was the Rája's by the sacred water. As a mark of joy he ordered prisoners to be free, oxen to be taken from the yoke, cows not to be milked, and the parrots shut up in cages to be released. The King seated on an ivory throne, had his hair decorated with a row of gems, his body was coloured with the yellow pigment *rochana* and his members



made fragrant by the sandal-wood, he wore a robe of silk on which was wrought the figure of swans, his dress shone in a golden mirror as the shadow of the celestial tree at sun-rise on the top of Meru's mount. His course from youth to the throne was like the moon when she attains her full-orbed greatness.

Except after smoke the brightness of fire is not seen, but he shone out at once with all his virtues ; the women accompanied him with their eyes shining through joy, as the polar star in a bright autumnal night. Atithi himself administered justice daily, giving to the citizens the ripe fruit of the testimony furnished, he only violated his promises in favour of his enemies, though a youth he was firm as a deep-rooted tree. He sent out spies as rays which made all know as clear as the sun in a cloudless sky—he slept at his own suitable time but watched by emissaries—his successful aims well planned ripened secretly like grains of rice lying hid in the stalk—even at the height of prosperity he never swerved from the right way as the salt sea however swollen still enters into the mouths of rivers, he never attacked his inferiors, as the blazing forest flame though aided by the wind does not assault the water. He valued alike the honest, agreeable and useful. He accumulated wealth to give to others as the cloud filled with water supplies the *chātaka*. As the magnet draws the strength of iron, so did he the power of his enemies. The merchants travelled on the rivers, as on lakes ; in forests, as in gardens ; in mountains, as in their houses ; as an elephant by its smell alone drives away other elephants, so did he his enemies by the prestige of his name. Atithi did not decline like the moon or ocean. He held the applications of poor but honest men a benefit to himself as are the clouds to the ocean, like the rising sun he dispelled darkness by the sense of truth. Although the rays of the moon enter not the nelumbium, nor the rays of the sun the lotus, yet his virtues penetrated the enemy, by his good qualities he became King of kings.

A son was born, named Naishadha : the father, whose deeds in spotless purity equalled the Nymphæa, ascended to heaven ; the son of lotus eyes and mind profound as ocean's stream, governed the ocean-girdled earth after him ; his son Nalus of fire-like power trampled on his enemy as the elephant does reeds. His son Nabhasi's body was fair as the azure vault of heaven, in his old age he formed friendship with wild beasts.



A descendant of his Ahinagus was noted for sweet words able to carry captive the stags. Visbasah another descendant left the kingdom to his son and clad himself in a dress of bark ; Dhruvasandha, a successor, ruled like the polar star : with stag eyes and lion's heart like the new moon he delighted the eyes ; to him succeeded a youthful monarch, the kingdom resembled the sky when the moon has just risen or a forest inhabited by young lions, or a lake not yet having the expanded lotus. As a small emerald is still an emerald, so the King though only six years old was still a King ; before he had learned his letters, he was instructed by wise men in Ethics, with years his body and virtues received increase. He entered on the stage of youth, the flower on the tree of love growing on the stalk of continual delight, a wine to be observed by maiden's eyes, an ornament diffused over the whole body.

But after a time he appointed his son Agnivarna, shining as fire, to the throne where with holy water and sacred grass he forgot his former state—the son resigning his kingdom to his ministers delivered himself over to the enjoyment of women, buried day and night in the interior of his palace, exhibiting at times only his feet to the gaze of his subjects, which resembled a lotus tinged with the rays of the rising sun. In tanks amid sport with his women he spent the day quaffing with them large draughts of wine amid the sound of harps and maidens of fair eyes. In the houses the lamp at night unmoved by the wind became witnesses to his deeds. His passions enfeebled by success were stimulated by drinking mango juice and the flowers of the Bignonia. Decay began, he saw destruction before him from his excesses, yet regarded not his physician's advice, he became enfeebled by consumption, with ghastly look, of low voice, leaning on others, his family became like the moon in its last quarter or a summer lake with only mud banks left, or a lamp with languishing flame—no son was born, though attached to so many women ; the diseases baffled the skill of the physicians as the wind a lamp. Soon in a grove near his house the ministers performed his last funeral rites, while his wife pregnant was invested with the royal dignity. His child on birth was warmed with tears shed at so melancholy an end of the father and was then refreshed with cold water drawn from golden vessels to inaugurate his line.





*On Filtering the Waters of Tanks in large quantities, for the use of Towns.*—By HENRY PIDDINGTON. Curator Museum of Economic Geology.

About four or five years ago I had occasion in reply to some queries addressed to me from Oudeypore by Mr. Brandreth, C. S., to consider this subject a little. I have kept no copy of my letter to that gentleman, but the matter has again been brought to my mind by the observations of Dr. Chuckerbutty lately published, and as the question is one of great sanitary importance, a record of any proposal for accomplishing this, cheaply, effectively, and abundantly, may be worth preserving. Every project of the kind will necessarily be subject to modifications in practice, though the principles may be found always to hold good, and the means to be perhaps more efficacious and cheaper than is commonly supposed.

There are two objects in filtering water, which are :

1. To obtain clear water, or mechanical filtering.
2. To obtain clear *and pure* water, or chemical filtering.

And these should be kept in mind as being distinct ; though as I shall subsequently shew, they may perhaps be combined and accomplished at one operation. We will first consider that we have the common river or tank water of Calcutta to deal with, and wish only to make clear—that is wholesome-looking—water of it.

The processes of nature in filtering her waters are—upwards or downwards, or diagonally, or horizontally, as between the close layers of stratified rocks ; and she uses an infinity of various materials and mixtures of these materials for her filters, some of which act simply to clear the water, and others to purify it. Many of these of both kinds either natural or artificially compounded are within our reach, and I set down here such as occur to me.

CLEARING MATERIALS,  
or Mechanical filters.

1. Common sandy earths.
2. Sands, coarse and fine.

PURIFIERS,  
or Chemical filters.

1. Coarse kunkur gravel\* of the limestone kunkurs, which is



- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| 3. The slates of all kinds.       | limestone or pisolite.               |
| 4. Porous sand-stones.            | 2. Coarse kunkur gravel of the       |
| 5. Jumma or glass of brick kilns. | <i>ironstone</i> kunkurs or pisiform |
| 6. Small shells and shelly sand.  | iron ore.                            |
| 7. Koah or pounded brick.         | 3. Ironstones and iron earths of     |
|                                   | all kinds from Basalt and            |
|                                   | earthy iron ores to the late-        |
|                                   | rites of Midnapore and Cut-          |
|                                   | tack, and the yellow ferrugi-        |
|                                   | nous earths.                         |
|                                   | 4. Chalk and massive kunkur.         |
|                                   | 5. Limestones, as that from Syl-     |
|                                   | het.                                 |
|                                   | 6. Black hornblende sand from        |
|                                   | Saugor Island, or other parts.       |
|                                   | 7. White clays of various kinds.     |
|                                   | 8. Soorkey.                          |
|                                   | 9. Charcoal and coke.                |
|                                   | 10. Bone charcoal.                   |

We desire to obtain first pure *looking* water, not forgetting that water may appear to be pure and yet hold unwholesome matters in solution. Filtering at one operation, both upwards and downwards is perfectly easy, and will in most cases give clear water at once. This is managed as follows :—See Plate.

A. is a wall enclosing any space with openings of any kind *at the top only*.

B. a second wall with small arched openings *b* below.

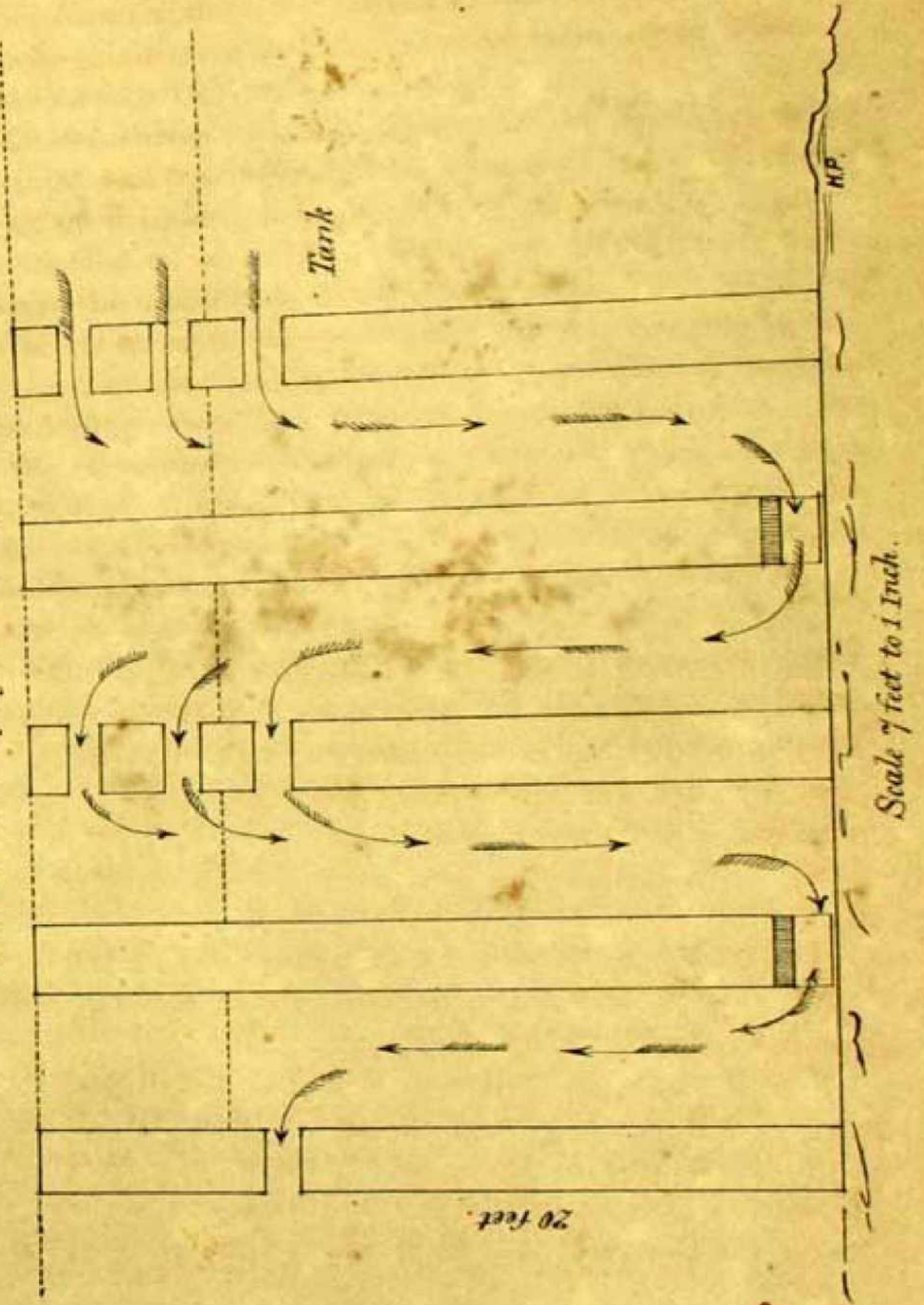
C. is a third wall with openings only at the top again discharging into the reservoir D. for the clean water.

Now if the spaces between A. and B. and B. and C. be filled with any good filtering materials from the first list, as fine washed sea sand from Saugor or the coarse *Muggra bally* used by our masons, the water which enters through A. (being the surface water which is always the clearest)\* will filter through it downwards beneath B. and

\* Some of the holes at A. &c. are always supposed to be below the level of the Tank, when at its lowest level in the dry season.



Section of Filtering Walls.  
Tank 20 feet and drying to 15 feet deep





in the country in England a *hard* water, i. e. it holds a considerable proportion of sulphate of lime in solution ; curdling soap even after it has been boiled, and is even said to affect the bowels of persons unaccustomed to use it. To correct this defect, the French use in their cisterns and filters what are called *Boules de Mars* which are merely an earthy red oxide of iron, and these decompose the sulphate of lime and render the water much better for domestic use. The white clays to be found in many places in India, and which all contain alumina, and some of them sulphate of lime (gypsum) will also frequently be found useful as chemical filters.

It is evident from what has been said above, that the mere clearing materials which serve to render the water limpid, and those which act chemically may be combined either in mixtures or in layers as thus. In ten feet of filter there might be five beds of coarse sand, and five of iron kunkur or chalk, or those materials may be kept separate in the two divisions of the filter, and thus that, by varying the filtering media, we may with great probability assert that we might obtain nearly pure water at a very small expense, whenever the Government or the Municipality, or any individual who can afford it, will undertake the cost of the experiments on a proper scale. If a long narrow canal was led from a tank to any convenient situation for a reservoir and different divisions, say at every ten or fifteen feet, were filled with different kinds of filtering materials, this would be the same process in a horizontal direction ; but not, I think, so efficacious as that which I have proposed, upwards and downwards.

H. PIDDINGTON.

*May 1st, 1852.*





*Diary of a Journey through Sikim to the Frontiers of Thibet.—By*  
*Dr. A. CAMPBELL, Superintendent of Darjeeling—with a Map.*  
*(Communicated by SIR JAMES COLVILE, KT.)*

(Continued from page 428.)

*Chateng, October 7th.*

Elevation 8,500 feet, started from Latong at 7 A. M. and did not reach our ground till 6 P. M. A mile from camp we crossed to the left bank of the Lachen by a rickety cane-bridge : the river a continuous sheet of foam ; which is the character of it, and of the Teesta all the way from the junction of the Rumam ; below that the water is heaved up in waves. The declension of the river's bed must be very uniform in each division of it, viz. in the way and in the foamy parts. The rate is very rapid ; Dr. Hooker estimated it at 11 knots an hour. Close to the bridge there is a fine cascade of 100 feet or more from an affluent of which I could not learn the name. At  $\frac{1}{2}$  past one we reached the "Takchoong" feeder which is a deep and furious one, and found the bridge at the proper crossing place had been swept away. Having ascended some way we found a crossing in progress of being formed. The operation presented a very animating scene. About 30 Lepchas having laid long Alder saplings from rock to rock in the torrents course, spread themselves across the roaring torrent, and by binding 3 or 4 of the saplings together for foot ways and running temporary rails, we all passed, the foam beating against the foot ways and wetting us all over. Keeping along the left bank for three hours we re-crossed to the right bank of the Lachen, and ascending a short distance came upon pines near the river's edge ; all the way from Chongtam the mountain tops are clothed with them.\* Our route now lay through an open forest of lofty Pines. At about 500 feet above the river and 2000 feet below the crests of the mountains, we crossed a recent landslip of great extent, and further on we crossed a roaring torrent running over a solid rocky bottom which terminated in a precipice 20 yards below the crossing, the water shooting in a cascade down to the river with a fall of 400 feet ; one of our coolies slipped his footing at the crossing, and was saved from being instantly shot over with the torrent by a man who promptly seized him. From this crossing we

\* *Pinus Brunoniana*, and *Pinus Khutrow*.



made a very steep ascent of 500 feet through a thick forest of Pines, at the top of which we suddenly issued on a wide and steep expanse of grass thickly studded with Anemones, asters, beautiful purple Primroses, and a profusion of blue and yellow flowers which all combined exhibited the gayest sheet of vegetation I had ever seen. For the first time I now realised the pleasure I had so often derived from reading accounts of the beauties of this sort to be met with, in the upper and inner regions of the Himalaya to the westward; and which are quite distinct from those which characterise the lower and outward ranges in both quarters of the chain.

The ascent continued through this loveliness to the top, and then Chateng itself, which is a broad spur from the Takcham mountain, spread out before us in undulating terraces for more than a mile square. Clumps of Pines adorned it like a noble park, and overtopping it to the north-west the snow-clad summits of Takcham shot into the sky to the height of 17,000 feet.

The views from Chateng are as fine as itself is beautiful. To the south and east a long reach of the Lachen river foams along with numerous cascades dashing into it from either side. From the west a torrent and waterfall come pouring down for 2,000 feet through an avenue of noble Pines; and to the north is the valley of the Lachen apparently terminated by a snow-topped mountain 12,000 feet high, which divides the valley of the Lachen proper from that of its western feeder the Zemu. Chateng would be an incomparable place for a residence in the rainy season if it was even tolerably accessible from the south, which it is not at present. The climate is much drier than that of Darjeeling. Hooker found the fall of rain and humidity of the atmosphere much less in the country above Choongtam, than in the lower part of Sikim.

*Yeunga, October 8th.*

Started at 8 A. M.: descended from the lovely Chateng to a torrent flowing into the Lachen from the west which we crossed; ascended thence toward the village of Lachen through a forest of noble Pines, and along a good road, the under jungle of the forest becoming more and more scanty as we advanced, the soil dry and sandy. Suddenly round\* the end of a beautifully wooded spur we came in full view of the village of Lachen, also called Lamteng, an exceedingly pretty



place and picturesquely situated on a gently sloping terrace covered with grass, and having handsome clumps of Pines scattered over it. A streamlet of clear water runs over a pebbly bottom meandering through the village.\* Lamteng consists of about 30 houses built of wood and raised on posts four feet from the ground, with lath and plaister walls neatly white-washed, or of a light blue colour. The roofs are shingled, with rows of stones to keep them down, and the lower story is generally walled in with stone, and used for goats, sheep and cattle. The only cultivation was some turnips near the houses, and a little buck-wheat higher up the hill. The inhabitants are all Bhotias, and are at present engaged in tending their flocks of yaks and cows higher up the valley. There was not a man, woman, or child left to look after the houses. The doors were locked and sealed, the latter a Thibetan custom. Lachen is the situation of a Phipun and of a Lapun, two officers who manage the joint interests of the Sikim and Thibet governments among the nomadic population of this valley. The Lachen Bhotias graze their flocks over a great extent of country in Thibet and Sikim, penetrating as far as Kambajong in Thibet to the north, and descending to Dengat† in Sikim on the south. The valley of the Lachen forming the cis-Himalyan portion of their beat extends as far as Kongra Lama where the Sikim territory terminates; thence they go over the Thibetan wilds towards Geeree and Kambajong wherever grass is procurable. These nomadic people, occupying as they do both sides of this border, are equally subject to Thibet as to Sikim. During the time they are in Thibet, or about half the year, they pay for cattle grazing there, and the same while within the Sikim border. Their payments are in curds, ghee and kine to Sikim; to Thibet they pay in shingles, bamboos, dye stuffs, and also in dairy produce. The Thibetan influence is upon the whole much greater in the Lachen valley than that of Sikim, although the territorial limits are to the north of it, and not disputed now. The origin and continuance of this state of things between two contiguous states are curious enough. It appears that a very long time ago a Phipun of Lachen—in the service of Sikim—became indebted to the Lama of

\* Elevation of Lachen 9000 feet. The Pine clad mountain forming its back ground is 1500 feet more.

† Dengat is three miles above Choongtam.



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*Yeunga, October 8th.*

Started at 8 A. M.: descended from the lovely Chateng to a torrent flowing into the Lachen from the west which we crossed; ascended thence toward the village of Lachen through a forest of noble Pines, and along a good road, the under jungle of the forest becoming more and more scanty as we advanced, the soil dry and sandy. Suddenly round\* the end of a beautifully wooded spur we came in full view of the village of Lachen, also called Lamteng, an exceedingly pretty



place and picturesquely situated on a gently sloping terrace covered with grass, and having handsome clumps of Pines scattered over it. A streamlet of clear water runs over a pebbly bottom meandering through the village.\* Lamteng consists of about 30 houses built of wood and raised on posts four feet from the ground, with lath and plaister walls neatly white-washed, or of a light blue colour. The roofs are shingled, with rows of stones to keep them down, and the lower story is generally walled in with stone, and used for goats, sheep and cattle. The only cultivation was some turnips near the houses, and a little buck-wheat higher up the hill. The inhabitants are all Bhotias, and are at present engaged in tending their flocks of yaks and cows higher up the valley. There was not a man, woman, or child left to look after the houses. The doors were locked and sealed, the latter a Thibetan custom. Lachen is the situation of a Phipun and of a Lapun, two officers who manage the joint interests of the Sikim and Thibet governments among the nomadic population of this valley. The Lachen Bhotias graze their flocks over a great extent of country in Thibet and Sikim, penetrating as far as Kambajong in Thibet to the north, and descending to Dengat† in Sikim on the south. The valley of the Lachen forming the cis-Himalyan portion of their beat extends as far as Kongra Lama where the Sikim territory terminates; thence they go over the Thibetan wilds towards Geeree and Kambajong wherever grass is procurable. These nomadic people, occupying as they do both sides of this border, are equally subject to Thibet as to Sikim. During the time they are in Thibet, or about half the year, they pay for cattle grazing there, and the same while within the Sikim border. Their payments are in curds, ghee and kine to Sikim; to Thibet they pay in shingles, bamboos, dye stuffs, and also in dairy produce. The Thibetan influence is upon the whole much greater in the Lachen valley than that of Sikim, although the territorial limits are to the north of it, and not disputed now. The origin and continuance of this state of things between two contiguous states are curious enough. It appears that a very long time ago a Phipun of Lachen—in the service of Sikim—became indebted to the Lama of

\* Elevation of Lachen 9000 feet. The Pine clad mountain forming its back ground is 1500 feet more.

† Dengat is three miles above Choangtam.





Digarchi for a sum of money which he was unable to pay. The debt of the capital sum was expunged: but the interest, secured by a bond, was made payable to the Lama and his successors, with a proviso that the obligation should be transferred to the Phipun's official successors, all of whom on taking the office receive this bond from their predecessors and discharge its conditions. The interest is paid in shingles for roofing, a specified number of which are to be prepared annually in the Lachen valley and forwarded to Digarchi. The La Pun, or Deputy Phipun, is appointed by the Thibetan officers at Kambajong. The Phipun holds his appointment from the Sikim Raja. The Thibetan influence is further secured by the fact of all the holders of stock in Lachen being indebted for advances of money or goods to persons in Digarchi. The usual rate of interest paid on such advances is 25 to 40 per cent. per annum. I look for further particulars of the peculiarities of Lachen as we advance.

At noon we crossed the Zemu, a large affluent of the Lachen from the north-west by an excellent bridge, and ascended to our encamping ground. Elevation of Yeunga 10,000 feet. Thermometer fell during the night to 44°.

*Tungu, October 9th.*

Elevation 13,000 feet. Ther. at 4 P. M. 42°. Started from our last ground at 7 A. M., and reached this at 3 P. M.; road good all the way and the distance not above 12 miles. I rode the greater part of it, the Lachen Phipun having sent us down three good ponies from Tungu. Half a mile above Yeunga the Lachen valley opens out considerably; the stream runs in a quiet ripple, with the banks shelving to its edge, and there is a good deal of level ground on both sides. The mountains however are as precipitous on either side as they are lower down, but do not, as there, form the immediate banks of the river. At Pangri which we reached in an hour from Yeunga, the valley again narrows, and the river becomes rapid and foaming. This alternation of meanderings and rapid courses obtains all the way to "Tungu;" yet in no place is there any cataract, or even a sudden fall. At 10 o'clock we crossed the Lachen—to its left bank—at Talom Samdong by an excellent bridge. Here there is a flat terrace half a mile long and 20 feet above the river, with 20 houses belonging to the Lachen Bhotiahs, who occupy them in their migrations up and down the valley. These



houses are built of stone without any mud or mortar, are of one story roofed with shingles, and of one apartment only : some of them are plaistered with mud, and all have a wooden door and shutter windows, which were tied up and *sealed*, as at Lamteng, the people being absent with the cattle, and not a soul left behind to watch the houses.

From Talom Samdong up the valley and bearing north-west, we had a fine view of the Chomiomo mountain : it is a magnificent mass of pure snow, the crest of a hog-backed shape with three sharp-pointed spikes, or small peaks rising out of it, and to the east up a deep gorge like valley the snowed peaks of "Milah" or "Minglah" came in sight. These peaks Hooker tells me are also seen from the Lachoong valley, and are to the south of "Momay Samdong."

The vegetation during this march has undergone a great change. Near the last camp we had fine pines, larches, tree junipers, large birch and willow trees, the large red and white rose, and many of Hooker's new species of trees, rhododendrons, mixed with 3 or 4 kinds of red fruited barberries—the barberry at Darjeeling is a damson blue—a very handsome thistle and gigantic hemlock extending to the river edge. The Tendook poison plant, *Aconitum palmatum* or *ferox*, is very common along this march.

After passing "Yatung" four miles below Tungu the trees become somewhat stunted, and here we came upon quantities of red currants—the first I have seen in Sikim—the Faloo and Tsuloo, dwarf rhododendron, mountain ashes, and dwarfed willows. The red currant—called kewdemah—is a beautiful large smooth-skinned berry in large bunches ; but bitter as well as very acid. The Faloo and Tsuloo rhododendrons are strongly and sickly scented plants, which cover large spaces of the mountain sides in this direction. The other species of rhododendrons are extensively diffused, covering whole mountain sides in many places principally in east and west exposures. The south wind in this valley at its upper part especially is strong and constant during the day. At night a piercing wind set down the valley from the north. The autumnal tints of the foliage are now becoming well marked, and the dark green of the junipers and webbiana pines contrasts vividly with the lighter green of some of the rhododendrons, and the yellow and scarlet tints of maples and barberries. No cultivation at Tungu. Herds of yaks are browsing on the steep grassy



declivities around it, while ponies with brood mares, and a few cows graze on the flatter ground of our encampment. The village consists of 20 wretched stone hovels with low pitched shingle roofs, over which a covering of pine bark is laid, the whole being held down by rows of stones two feet apart. The shingles and battens are made of the wood of the various kinds of pines, and are prepared all along the valley above Lachen—or Lamteng—for home use, and for export to the Thibetan stations of Geeree, Kambajong and the city of Digarchi. The favourite size for shingles is 4 feet by 1. The interior of the houses corresponds in wretchedness with their exterior. The people sleep all huddled together on planks laid on the ground, and have no furniture of any sort: the fire is lighted on the floor, with upright stones placed in triangles for the earthen cooking pots, and for the large earthen tea pot which is always on the hob. Dirt, smoke, tattered garments which are never changed, and faces which are never washed, are the invariable characteristics of the Lachen Bhotias. Men and women dress alike in loose woollen wrappers with very long sleeves, woollen caps and boots. The men carry a small brass tobacco pipe in the girdle which they are constantly smoking, and rarely carry arms of any kind. They are very dark in complexion, but it is more the darkness of colliers than of the tint of the skin, and is probably the result of sitting over smouldering sheep-dung fires, and of engrained dirt; for some of the children are almost rosy.

*Tungu, October 10th.*

Halt here to-day as the morning was cloudy with drizzling rain, and our intended visit to Phaloong and Kanchanjhow would have been useless in such weather. Having seen these places we purpose moving on to the Pass of Kangra Lama, which is about 12 miles up the valley, and at the head of it.

We have had some very good and clean made yak milk butter from the village, and we have replenished our larder by slaughtering a young yak, the condition of which is very promising.

The Bhotia who sent it came to beg for one of the feet with which to pacify the mother at milking time, and carried it away with him.

*October 11th.*

Drizzling rain all yesterday, last night and this morning; so that





we are weather-bound; our great object now is to see what we have so nearly reached. How I long to see that mountain Kanchanjhow from the plain of Phaloong, described to be such a glorious sight by Hooker! The character of the rain fall here is different from that farther south—at Darjeeling for instance. It is lighter and drizzling, accompanied by a thin grey mist, and this was equally the case in July when Hooker was here for 7 days.

There is no cultivation of any kind here at present, nor was there in July. The land about the village has the appearance of having been sometime ago terraced for cultivation, and wheat was grown here when the Thibetans held it. Turnips grow, I believe, but nothing else is tried by the present inhabitants, who are obstinately idle and lazy: a few beautiful purple primroses are still in flower in sheltered places, but the winter is setting in rapidly. Ther. at 11 A. M.  $41^{\circ}$ . During the night it fell to  $39^{\circ}$ . At noon  $37^{\circ}$ —heavier rain and sleet: at 4 P. M.  $34^{\circ}$ , and snow. Some of our servants have suddenly got dropsical swellings of the face and feet, which they attribute to the great cold. These swellings are not attended by any pain or fever, but merely with lassitude and want of appetite. What *will* become of these cold-stricken creatures if we get into Thibet? I have lost two goats since yesterday: the symptoms were those of poisoning, saliva running from the mouth and nostrils, swelling of the stomach and constant bleating. The Tendook aconite is abundant here, and the leaves of one of the rhododendrons are poisonous for cattle; it is named the “Kema Kechoong.”\* The smoke of its wood is very pungent and swells the eyelids. The juniper wood makes by far the pleasantest fire; it burns clearly and quickly, with a fragrant odour and with very little smoke or ashes. This is important when you have the fire as we have it, on the middle of the floor of a small hut without any chimney. The openings in the shingle roof however are numerous and serve for smoke vents, as well as for leaks and light holes. The Doongshing, Webbiana pine is the wood most used for shingles, being the easiest worked, and lasts 3 to 4 years. The juniper shingles last longer; but the wood is harder, and these people avoid labour to the utmost extent possible, every thing beyond looking after

\* Rhodo. Cinnabarinum.—Hooker.



their yaks, and riding their ponies, being distasteful to them. The yak is a shorter lived animal than the cow of Sikim. After 7 or 8 calves the female is much aged; the cow will give 10, or 12, and even 14 calves. The period of gestation in the yak is said to be 9 months exactly, of the cow 10 or 20 days more. The flesh of the yak is, I think, the best meat that can be put on table; it is of delicate flavour, tender, juicy and eats quite short; the gravy is totally free from greasiness, and the meat of stringiness, which cannot be said of beef or mutton.

*October 12th.*

Still detained by bad weather. It snowed till midnight, and is raining this morning. The snow has not lain at our camp: but the mountains all round us are snowed from the top to within 500 feet of us. Ther. rose during the night to  $35^{\circ}$ ; it was  $34^{\circ}$  at 4 P. M.

A string of 50 laden yaks has just arrived from Kambajong in Thibet with wool for the Phipun of this place. They came in two days. The average load is about 3 maunds, 240 lbs. The yak gear is very simple, a thick pack-saddle of blanketing, over which a saddle tree of a tough rhododendron wood is girthed with yak hair ropes, and secured by a crupper of the same material. The nose cartilage is pierced, and a hair rope in it is the only bridle. The ears are decorated with tufts of scarlet wool, which are very becoming. These pack animals are all geldings; they were in fine condition, the long hair on the belly reaching to the ground; the common colour of all we have seen is black all over, one in 15 or 20 is white-tailed and white-faced. Some are black and white mixed, and a few are dun. The yaks are kept in Thibet as bulls till 3 or 4 years old; they are the only animals used there in the plough, and for loads. The plough in use about Digarchi is the same as the Bengali one. The materials for it go from this valley and Lachoong; the oak and birch are the favourite woods. The people generally move downwards from this place in Noor, to Talom Samdong, then as the cold increases to Lachen (Lamteng), and downwards as far as Latong and Denga. The migration upwards is performed quite as gradually, beginning in April. All the rain and snow falling at Tungu come with southerly wind, scarcely any of either ever fall with north wind, which always indicates steady and clear weather in this part of the world.



*October 13th.*

6 A. M. light clouds coming up from the south ; to the north it is all clear. Ther.  $40^{\circ}$ , surrounding mountains snowed to 700 feet above our camp. A portion of Chomiomo mountain in perpetual snow is visible : bearing north-west.

The Bhotias of the village are already assembled on the green, sitting in a circle round the headman, all busily talking, and all smoking their brass pipes, which every man carries at all times stuck in his girdle. This mode of assembling is a daily practice, generally in the morning and evening, but often at other times. It is an idle gathering very often ; but at other times business matters are discussed and settled.

*October 14th.*

At 7 A. M. yesterday it suddenly cleared, and we started on ponies for Phaloong to get a view of Kanchanjhow, Chomiomo and the Choongoo Kang mountains of perpetual snow, which respectively lie to the north, north-west and east of Tungu, and the Lachen valley. Our route lay east by north, and along the right bank of the Tonguchoo, a stream which falls into the Lachen, below the village of Tungu. Ascending about 1,000 feet, we came to a dozen of black yak hair tents, in shape like those of the Israelites, occupied by as many families of the Lachen Bhootias tending their yaks ; they had come down the previous day from Phaloong in consequence of the fall of snow, and told us that the Thibetans from Geeree and Kambajong, who had been with them at Phaloong since July, had from the same cause retired with all their yaks and sheep across the Kangra Lama Pass into Thibet. The Lachen men will gradually descend their own valley as the winter season advances to Deenga, grazing their cattle on the way at Tungu, Talom, Samdong, Lachen or Lamtong, Latong. The Thibetans have retired to Zeumchoo, and will do so to Geeree and Kambajong, where they rely principally on straw and hay for carrying their cattle through the winter.\*

A mile beyond the black tents I got a glimpse of Kanchanjhow with a few light clouds scouring over its summit. I was leading our party ; the bridle path was good and I pushed on in a high state of

\* Geeree and Kambajong, although further in the interior of Thibet than Zeumtro, are at a lower elevation and warmer.



excitement for an hour, when I reached a turning that brought the mountain in full front of me, and here I had 20 minutes of great delight before any one came up, and before the envious clouds had greatly marred the prospect. I did not however get a full view at any one time of this noble mountain, which rises within 3 or 4 miles distance to 5 or 6,000 feet above where I stood at 15,000 feet; masses of fleeting clouds obscured large portions of its sides, and occasionally flew with the rapidity of lightning over its crest, leaving its sides and base only in full view, which was very tantalising.

It is a table-topped mountain, the outline of which describes a very flat arch; the dip to the west is sudden, to the east it is perpendicular, and the south face is equally so. The summit is an enormous bank of snow, at least a mile long, of the purest whiteness, and unbroken anywhere by protending rocks. The cliffs in front were sprinkled with newly fallen snow, and from their base to the foot of the mountain lay a mass of sloping snow of 2,000 feet or so in breadth.

Advancing further, we ascended gradually by a sloping spur to Phaloong, which is an open expanse of undulating ground, or a succession of downs extending for 3 miles or more in a North East direction to the base of Kanchanjhow, and of nearly equal breadth, being bounded on the east by the valley of the Ihachoo, and on the west, by a mountain range of easy slope and grassy surface, which divides Phaloong from the valley of the Lachen. The whole of Phaloong is quite bare of trees or shrubs, but affords excellent pasturage in grass sedges and numerous herbs. The mean elevation of the downs is 16,000 feet, the bounding range to the west being about 500 feet higher, with similar pasturage to its summit on the south-east exposure; and nothing but bare rock and loose stones on the north-western one.\*

The ridge which divides Phaloong from the Lachen valley was thinly snowed over at noon. Phaloong was so at 8 A. M.; but it all disappeared by 10 o'clock under the rays of a very hot sun, which

\* This is the character of the Lachen valley also all the way from Tongu to Kangra Lama, when a red-coloured rocky spur from Chomiomo comes down in an easterly direction, its flank facing you as you look to the north, and appearing to shut up the head of the valley completely.



warmed the atmosphere immediately it appeared, and gave a delightful feeling of elasticity to the air while it remained unclouded.

At 2 p. m. on the mean level of Phaloong where Hooker took Barometrical observations, and the boiling point of Thermometer, the Temp. was  $45^{\circ}$ ; the sky was cloudy, and a light snow drizzle falling.

Phaloong is about 7 miles from Tungu. About half way the Tungu stream is joined from the north by the Zhachoo, which rising from the western base of Kanchanjhow, sweeps round and bounds Phaloong to the east. For a distance of three miles the Zhachoo runs quite sluggishly and very tortuously through a flat swampy valley, which has all the appearance of a lake bed. After emerging from this swamp the stream is precipitated by a sudden fall over a collection of rocks and stones at the southern extremity, whence its course is rapid, and its bed very rocky. From the upper or north-east extremity of this flat portion of the valley of the Zhachoo, there is a road to Momay Samdong at the head of the Tachoong valley; it goes over the Pass of Seeboolah, which is just now heavily snowed, and is probably 18,000 feet high.

As this route to Lachoong is in the Sikim territory, we have been urged to take it: but I have the greatest desire to go through Thibet to the Cholamoo Lake, and get into the Lachoong valley from the north by the Donkiah Pass, and I hope to accomplish this without offence to any one. During the ascent to 16,500 feet at Phaloong, my breathing was but slightly affected; there was a feeling of faintness with a constant desire to take full inspirations, and nothing more. When standing still my respiration was not the least incommoded. After descending 1,000 feet, however, a racking headache came on, and by the time I reached Camp at Tungu, 6 p. m. it was so bad I could not sit up at all. A feeling of tightness round the occiput, as if a cord was being hard pulled on it, was very distressing, and violent vomiting ensued, which continued at intervals till daylight. The Lama and five servants who accompanied me were similarly affected sooner than I was, and their headaches also have continued till to-day. Neither Hooker nor his servants were the least affected by the ascent of yesterday; but they have been at this sort of work for three months past, and are well used to high elevations. I felt no inconvenience at elevations below 15,000 feet.



The contrast between the climate of this elevated region, and that of the central portion of Sikim is most remarkable at this season. Here the rain never falls heavily, the air is dry and bracing, and the sun's rays have an immediate effect in melting the recently fallen snow, and drying the ground. The pasture ground is very peculiar, and altogether different from what I had anticipated. I looked for undulating tracts of rich and luxuriant grass extending along the base of the perpetual snow, but with the exception of Phaloong, the grazing grounds are almost precipitously steep. They are every where covered with numerous herbs, many small, grass-like sedges, and only a few tufts of grass; this sort of vegetation, interspersed with the strong-scented dwarf rhododendrons, which at 16,000 feet and upwards cover the ground like heather, and vary from a foot to four inches in height, with bushes of dwarf juniper, barberry, rose, and rhododendron shrubs, characterises the picturesque haunts of the fearless and steady-footed yaks, goats and sheep of these regions. The yak delights in the steepest places, and when seen on the mountain side at 1,000 feet or more above you, they seem to the unpractised eye of a novice like myself to be in constant danger of tumbling down. I have often checked myself since our stay at Tungu from calling out to the Bho-tias to remove the yaks from the dangerous-looking places in which they graze. Aconites, dandelion, cowslips, a beautiful blue gentian, astragali, primroses, potentillas, and a large-leaved sage, are some of the numerous herbs which form the rich pasture in this direction, and all—except the aconites, which are carefully avoided by all native animals,—are eaten by the cattle, the condition of which is excellent, and the milk of the richest and purest quality.

*October 15th.*

A beautiful morning, and we at once decided on moving upwards, the Lama and the Lachen Phipun being appointed to take the Camp close up to the Kangra Lama Pass, while we were to spend the day at Phaloong, and see all the mountains which were but partially visible on the 13th, and join them in the evening. For this purpose, we started at 7 A. M. by the route already described, and soon reaching Phaloong, came upon such a scene as I never even imagined, and never saw anything to equal.

First of all, to the north there was the beautiful Kanchanjhow



mountain in all the splendour of unclouded brightness, a monster mass of brilliant snow; to the north-east and east, the Donkiah Lah 23,000 feet; the Seeboo Lah Pass 18,000 feet, and the Changoo Kang mountain 22,000 feet, were in equal glory; to the west, no less lofty and brilliant, the peak of Chomiomo was full in sight; while down the valley of Lachen to the south-west, innumerable snowy peaks of minor note closed the view behind us. Ascending the ridge which divides Phaloong from Lachen—to about 17,000 feet—our prospect was still more extended and beautiful. Here we had Kunchinjinga to the W. S. W., Kanchanjhow, E. N. E., and not 2 miles off, with the intervening downs of Phaloong as a foreground at our feet. To the north and west a fine rounded red and yellow coloured spur from Chomiomo, extending across the head of the Lachen valley to Kangra Lama, and standing in bold relief against the clearest azure sky, gave me a delightful foretaste of Thibetan scenery. The whole was such a round of novel glories, such a vast picture of splendid objects on a great scale, that I was overcome with the deepest emotion. I could not realise a landscape of this gigantic nature, distinctly and in detail, far less can I describe it. Never however shall I forget that scene; then it was that I first found out the real depth and intensity of the hold these mountains have always had on my mind and feelings, nor did I then wonder, nor do I now, at their being objects of veneration and worship to the human beings who dwell among them.

From the ridge above Phaloong a very large glacier on the east face of Chomiomo is visible; it discharges itself by the Chomiochoo, which falls into the Lachen five miles above Tungu. The south-east exposure of the Phaloong ridge has soil and pasture up to 17,000 feet. The north-west exposure is quite barren and rocky at that elevation; but at 16,000 feet it is covered with a diminutive heather-like *Rhododendron*—*R. Setosum* of Hooker—lower down, the pasture is composed of small rushes, grass, and numerous herbs. The whole of Phaloong is covered with a knobby peaty soil, on which the vegetation is now browning fast under the approach of winter.

We had a fine breeze from the south all day, the air was light and bracing, sky clear and cloudless. Temp. at 2 P. M. on the flat of Phaloong  $51^{\circ}$ . Wet bulb Ther.  $44^{\circ}$ . No snow at 17,000 feet.

We saw a flock of forty wild sheep; it is called Náá by the Bhotias,



and is the *Ovis ammonoides* of zoologists, I believe. They were basking in the sun on a hill side at 16,000 feet. The younger ones were of a bluish grey, the old ones whitish. I also fell in with a large covey—sixty or eighty—of chakoor-like birds, their flight and size that of chakoor, but they had no black bars on the wing, nor red legs. Crossed the Phaloong ridge into Lachen valley, which we ascended to our camp at "Sitong;" elevation 16,000 feet. Temp. at 6 P. M. 38°. No fire-wood. We are four miles below the Kangra Lama Pass. Some wood was brought from Tungu, eight miles. The coolies are all suffering much from headache and the cold.

*Yeumchoo or Yeumtso, Thibet, 16th October.*

The Ther. fell at Sitong during the night to 21°; at 7 A. M. it was 32°; a cold north wind blew down the Pass all night; at daylight the cold was intense; but as soon as the sun appeared, the north wind ceased and the temperature was delightful. We were pitched in the dry bed of a stream coming from the north-west, which rises to the north of Chomiomo. The Lachen was not a foot deep here. Kanchanjhow towered over our heads due east of us. We heard last night that a Chinese guard was posted on the frontier at Kangra Lama to arrest our progress. We sent to see, and found it true, for they told my messenger we should not pass into Thibet, as their necks would be the forfeit if we did. This did not disturb our rest, and although hardly pressed by the Lama not to move the camp to the Pass until we had previously seen the guard, and arranged for a passage through Thibet, I resolved to move up to the frontier in the morning, and trust to what might happen there on meeting the Thibetans for the accomplishment of our wishes. The bright sun, highly rarified atmosphere, and gazing at the dazzling snow all day yesterday, have made my eyes sore and weak. I have a veil; but it blinds me to wear it. The skin of my face is inflamed, and very painful: but I have escaped all headache and discomfort from the high elevations. Hooker has not however done so, with all his practice. He feels sick and head-achy like every body else in camp, but he takes violent exercise all day on foot, whereas I have ridden whenever I could, and was able to do so almost all day yesterday.

At 8 A. M. this morning having with much difficulty started our benumbed coolies, we left "Sitong," and marched up to the pass of





Kangra Lama ; our route lay all the way along the Lachen, Kunchinjhow on our right, Chomiomo on our left. The valley of the Lachen opened out into flat terraces, and contracted by turns into rocky gorges, until at four miles from Sitong, gradually rising on a sloping plateau, you leave the Lachen to the left, turn the shoulder of Kanchanjhow on the right, and find yourself without any effort of ascent on this side, or any descent on the other, on the Thibetan territory, and beyond the Himalayan chain. Where this transit takes place it is a grassy open down, sloping if at all to the south, and about a mile broad from the Lachen on the west, to a swampy flat at the foot of Kunchinjhow on the east, from which swamp a dribbling stream joins the Lachen a little way below. On this flat ground the boundary marks of Sikim and Thibet are conspicuous. They are small cairns of stones, in one of which a written certificate is annually placed by the Thibetans, that the boundary has been examined and found correct. This is the Kangra Lama Pass so to speak, but no Pass at all in the sense taken of the term in the Himalaya generally.

It is probably the easiest passage in the world through a mountain range ;\* the elevation at the frontier pillars is 16,500 feet.

A mile below the boundary two Thibetans, who had been watching our progress up the valley, joined us. They were not armed, but I suspected their purpose of stopping us, and had them questioned. They admitted they were Thibetans : and asserted that the ground we were then on was Thibetan. I told them that we were in Sikim, which was the case ; and as I had found them in Sikim, and ignorant of the proper boundary line, I should regard them as Sikimites for the rest of the day. They walked ahead quietly until I passed the cairn ; then they commenced calling out to their comrades who were encamped close by, and objected to our progress, but offered no actual obstruction to it.

Feeling that this mode of proceeding would not answer, and at the earnest desire of the Lama who was becoming alarmed at being implicated in a trespass on Thibet, I stopped close to the cairn, and asked to see the officer commanding the Thibetan guard, to whom I wished to communicate my reasons for desiring a passage through

\* More correctly speaking the easiest termination to a passage, for the real passage through the chain is the Lachen which arises beyond it.



Thibet to the Donkiah Pass. After some delay, the Dingpun commanding the party with the Deputy of the Soobah of Kambajong, and fifteen sepoy, came up. I told the Dingpun that I had come up the Lachen valley to his frontier on business, and to see the country, that I had also to go to the Lachoong valley and the Donkiah Pass, and that there were three ways of doing this. One was to march back to Choongtam and up the Lachoong; this would take me ten days. The second was to cross the Seeboolah Pass from the head of the Lachen to Samdong in the Lachoong valley; but that route was deeply snowed and dangerous. The third, the most obvious, and the easiest, was to go round the northern base of Kanchanjhow, and come out by the Donkiah Pass, and I wished to encamp that night at Yeuntso, going on to the Pass by Chalamoo without delay. I said I knew that the route proposed was not inhabited, that therefore no one could be alarmed or inconvenienced by our passage, and as it would greatly convenience us, it was not I thought worth their while to make us go back so far, or to endanger our lives by braving the Seeboolah Pass after the recent heavy fall of snow. There was much more talk between the Thibetan party and my friend the Lama about the propriety of my waiting for instructions from Kambajong, which the Dingpun suggested he would ask for, the unprecedented nature of my request, and how all their throats might be cut by orders from Lassa, if a passage was effected by our party. The talking might have lasted a week without any result; at all events I thought so, and time was precious: to cut it short therefore, and be no longer standing idle at the Rubicon, I told the Dingpun I would with his leave move on, and I did so accordingly on foot, and unopposed by word or deed from any one; leaving the Lama and all our people to arrange with the Dingpun about our followers and baggage to follow me at his leisure. Hooker rode straight on into Thibet when I stopped to parley with the Dingpun, and I saw no more of him that day till we met at Yamchoo in the afternoon, after he had been all the way to the Chalamoo Lake, and whence he was then returning towards Kangra Lama in search of me, not being aware that I had followed him.

Leaving Kangra Lama at 11 A. M. stick in hand, and with a cloth cloak carried over my shoulder to insure some covering for the night, and followed by one chapprassey—Seetaram,—who had not the good



sense to bring on the pony when I left the Dingpun, I ascended a gentle grassy slope in a north-easterly direction for less than a mile, when I came upon a flat expanse of three miles broad, bounded on the right—south—by Kanchanjhow, on the left—north—by a fine red spur of Chomiomo; the Lachen flowing very slowly and in a trifling stream nearly in the centre of the flat expanse. There were about 100 yaks feeding on this expanse. They were tended by a dozen robust Thibetans, who stared at me in dumb amazement; their black hair cloth tents were pitched close by, each with a huge black and tame watch dog at the entrance, and some rosy-cheeked children playing around. The pasture was short, quite scorched by the frost and sun, and crumbled under my feet like snuff. The sun was bright and very hot, the air dry and elastic, the sky blue and quite cloudless, not a tree, shrub, or herbaceous plant to be seen. I waited a little to wonder at this change, so great, from the moist forests, and cloudy skies of Sikim, and then moved on without any guide, keeping close by the base of Kanchanjhow, its nobly expanded sides, and rounded summit of unbroken snow towering over my head to the south of me. Hugging the base of Kanchanjhow, and at an elevation of about 400 feet above the Lachen, I kept on due east till 2 p. m., when I reached a rocky spur from the mountain, from which I saw the Yeumtso Lake to the north and east of me. Halted here for Seetaram, who lagged behind, having been attacked with fever since we started in the morning. I had a good deal of oppressed breathing, although I walked slowly, and my pulse had been 108 all the way. The prospect at this point is very fine. To the south, there is an immense saddle of snow, probably two miles broad, lying between two peaks of Kanchanjhow; below me to the north is the valley of the Lachen, flat, with the river winding through a whitish expanse of sandy like deposit—Carb. of soda. To the east and trending north a fine red mountain—a spur from Kanchanjhow, which divides the Yeumtso and the Cholamoo Lakes. To the north-east the view is closed by a table-land, bare and scorched, which stretching from Donkiah bounds the Lachen valley in that direction, and is lost in the undulating downs to the north, which seem to extend for ten miles at least in that direction and towards Geree. To the north—and over a rocky range of red and white quartz which bounds the Lachen valley to the north—and about forty



miles off as far as I can guess, is seen a long range of sapphire blue hills running east and west, the west end peaks north of Kambajong tipped with snow. To the west, and closing the Lachen valley, the great peak of Chomiomo rises to 22,000 feet, a splendid mass of perpetual snow north-west, and very distant, 60 or 70 miles perhaps, are seen three lofty snowy mountains. They must, I consider, be quite as far north as Digarchi, but to the west of it, and from the extent of snow on them in a position where the snow line may be taken at 20,000 feet, their elevation is probably 24,000 feet or more.

From this spur I descended in a northerly direction over rocks and stones to the outlet of the Yeumtso Lake, which I reached at 3 p. m. very tired indeed and foot sore. I carried Hooker's barometer for the last two miles, as the chupprassie was quite ill and scarcely able to walk. Here I made up my mind to pass the night, a dreary prospect enough, without shelter, food or clothing, at an elevation of 17,000 feet. I saw nothing else for it; I could not walk back to Kangra Lama, nor did I know whether I should find my people there if I did, and my companion—the chapprassie—was quite unable to do so. He had a blanket cloak only, and I mine, to cover us; a bit of ginger-bread, and an old ship biscuit, was all we had to depend on for food: I saw no signs of any one following us, and was quite ignorant of Hooker's whereabouts, as we parted without any understanding about meeting. He had a horse, but no attendant. I had no horse but had a companion, and in this plight were we wandering during our first day in Thibet. From the outlet of the Lake to which I descended, and where I intended to bivouac for the night, the scene was very striking, and was thus noted by me at the time, "I now sit in a position from which all is superb; it is at the outlet of the Yeumtso Lake at its north-east angle. The water is of a pale green colour, and a southerly breeze, descending from an extensive glacier which feeds the Lake, is carrying a swelling ripple to my feet. The form of the Lake is irregular, longer from north to south than from east to west and about three miles round. It stretches before me to the base of an immense bed of glacial snow, which runs far back—south—into the masses of Kanchanjhow, and which is raised about 100 feet at its lowest part above the Lake, into which is discharged a trickling stream now frozen over. To the south-west is the enormous



saddle of snow noted before, and dividing two peaks of Kanchanjhow, a feeder from this saddle running easterly also supplies the Lake at the south-west extremity.

Further to the west is the great rounded summit of Kanchanjhow, of towering height and dazzling brightness.

To the north-east, a fine red and yellow spur from Kanchanjhow, which divides the Lake from the Cholamoo one, and to the west the rocky and bare spur from which I have just descended.

The eastern bank of the Lake is grassy, and now scorched, along the water's edge, but high and rocky beyond. On the west it is abrupt and rocky. The outlet is thirty paces across : but the stream is not a foot deep, nor more than 5 feet wide. The air is excessively dry, parching up my lips and cracking the skin of my face ; the sun is hot, but the wind is bitterly cold, and sudden blasts from the mountain raise whirlwinds of dust. The base of the mountain is not half a mile from the Lake ; it rises quite abruptly. Snow is lying deep in the hollow places to within 200 feet of its base, and is sprinkled to the same line on the steepest places, which are of solid rock.\*

Not a plant is to be seen in the Lake, nor on its stony margin. Not a fish, or shell, in its waters ; nor any saline deposit near it, but its water is sweet : the sky is clear, brilliant and blue, and all around is new and most imposing. Oh that I could paint or draw ! and how delightful it would be to sail, or row, on the green rippling waters of this little Lake now for the first time spied by European eyes !

As I had done inspecting and admiring the Lake, the Lama came up much fatigued and breathing very hard ; his presence relieved me of all apprehension about being out all night, as he told me our tents and baggage were coming up. Hooker says it would have killed us at the present temperature of the night to have lain in the open air ; and I dare say he is right. The Lama told me that after I had started from Kangra Lama, the Thibetan guard had agreed to allow our people to follow me, and that Hooker was at Yeumtso close by, where we were to pitch for the night. This was good news ; I descended a short way, and found him there quite knocked up, and with a violent headache, the effect of great exertion at this elevation, 16,800 feet. We

\* The snow line on the northern face of Kanchanjhow in October may be taken at 18,000 feet.



were both glad to lie on the ground, cold as it was, till 6 o'clock, when the tents came up.

As we lay shivering, the Thibetan guard, which had accompanied our baggage from Kangra Lama, came marching in. It consisted of an officer and fifteen men, dressed in ragged blue cloth cloaks bound round the waist with yellow girdles, cloth boots of various colours—red, green and blue, and black felt caps; each man carried a load of clothes and a matchlock strapped across his back, from which projected a forked rest, like antelope's horns; a bow and some arrows with an old cartridge pouch completed their equipment.

The Dingpun, or officer in command on the part of the Chinese government at Lassa—and the Lt. of the Kambajong Soobah—a civil officer—brought up the rear, mounted on yaks with high saddles over which, and under, a quantity of bedding, warm clothes and other articles were stowed in the bunchiest and least military fashion possible. These officers did not carry any arms. The Dingpun was dressed in green with a large orange-coloured cap, in the crown of which was a round brass button, the sign of his rank. He was not five feet high; he was sixty years of age, very fat, dark-complexioned, smiling and very greasy; his countenance was a picture of indecision and imbecility, and he did not belie it in any way. I shall however say no more to his discredit. I wish him most heartily a long life and great promotion in the ragamuffin band to which he belongs, with the happiest reminiscences for gratifying us as he has done on this occasion. The guard is to accompany us to the Donkiah Pass, and see us fairly out of Thibet, so that we may now expect to part very good friends, and I hope we shall do so.

We are pitched inside the kraals, or square enclosures of loose stone used by the migrating yak herds of Thibet for pitching their black tents in, and our people are crowded round large fires of yak dung, the only fuel this country affords. These fires give a great deal of heat, but are attended with interminable and intolerable smoke, and are not at all suited for cooking. The flavour of all roasted, toasted and grilled articles is disagreeable, and it is very difficult to get any thing fully cooked where the boiling point of water is so low.

This may be one reason for the Thibetans always eating their animal food dried and raw, instead of cooked as we do. I am very headachy





after my long and elevated work ; all my servants and coolies worse off from the same cause, and the extreme cold, some of them being very ill indeed and unable to move. They have come over Kangra Lama, 16,000 feet, and have ascended 6 or 800 feet more in coming here, swollen faces and inflamed eyes are numerous among them. My own face and eyes are quite red and much inflamed. The glare from Kanchanjhow was excessive, but I could not keep my eyes off, so attractive was the novelty of being all day along the base of its perpetual snow. Thermometer at 6 P. M.  $34^{\circ}$  ; a light breeze from the south ; calm at 9 P. M. with a sky of the clearest blue. Temp. at 10 P. M.  $26^{\circ}$ .

*October 17th.*

Halt at Yeumtso to see about us, and for Hooker's meteorological observations, &c. Thermometer at 6 A. M.  $10^{\circ}$ . Wet bulb do.  $9\frac{1}{2}$  ; minimum temperature during the night  $5^{\circ}$ . A black bulb thermometer placed in a radiating metallic bowl fell to  $3^{\circ}$ . Ther. in our small tent at 6 A. M.  $14^{\circ}$ . The sun rose with us at 6 hours 40 minutes. Heavy hoar frost on the grass, and the marshy pools along the Lachen and close to us are frozen over since last evening.

It is a brilliant morning with a light air from the north-east, and I am enchanted with this near sight of Kanchanjhow.

9 A. M. Ther.  $32^{\circ}$ , brilliant sunshine ; all my people and the Lama's people also are very ill with head-ache and vomiting ; some of the coolies have dropsical swellings of the face and feet, and none of them can eat ; they lie on their faces and knees in the sun, pressing their heads with their hands, and are quite as wretched as any sea-sick people I ever saw. Hooker's fellows are well and lively.

The Dingpun and his men have paid us a friendly visit in our tent. We have regaled them all with snuff and rum and water. The few English articles we have with us, have been much admired by them, especially a detonating gun, pistols, telescope, and our broad-cloth coats. I presented the Commandant with a Tartan shawl and some rupees for a dinner to his men, which made them all vastly well pleased. The Dingpun despatched a report of our progress to his superior officers at Kambajong while in our tent. Went to the Yeumtso Lake with Hooker, collected some minerals, found ice half an inch thick along its margin at 11 A. M. ; reckon it to be three miles round or more, and



found it 10 feet deep at 20 feet from the shore. Small pieces of blue slate numerous on the east bank only, and a white tasteless substance on the grassy banks—Pen. or Carb. of soda. There were large flocks of the Brahminy duck, with a few grey geese, and widgeon on the water. Not an insect to be seen: but large flocks of grey “stone chats” flew about the rocky places. Holes of the “goomchen,” or tailless rat, were very numerous about our tent at Yeumtso, as well as burrows of the marmot called Kadiapen.\*

Thermometer at noon  $52^{\circ}$ , wet bulb do.  $37^{\circ}$ , a fine breeze with a delightful feeling of elasticity and dryness in the air. The brightness of the sun is incomparable, the sky is of the clearest blue. The great mountain ranges of Kambajong, and far to the northward and westward, of brown and reddish hue tipped with sapphire blue, and with perpetual snow, with the intervening plateaux of Cholamoo and Gereë in yellow grass and fading herbage, all united make this country to my taste a most attractive one at this season, notwithstanding the excessive cold, its utter barrenness, and total want of population.

In the afternoon we crossed the valley of the Lachen from Yeumtso due north; it is a bed of white and bare sand, a mile and a half wide, the stream running tortuously, very slowly, and not a foot deep towards the west. Ascended the rocky range immediately bounding the valley to the north; it is 500 to 800 feet above the river, and composed chiefly of a close white and pink quartz,† with large rounded masses of gneiss and gneiss rubble. Crossing this ridge, but without

\* During our short stay in Thibet we fell in with the Goa antelope, another antelope larger than it, but smaller than the Chiru, a very handsome large fox, reddish brown with a bushy grey tail, a hare or rabbit frequenting rocky places, light grey, with white scut and a patch of dark bluish grey over the croup. This animal was abundant; it always ran with its ears erect, and lastly, we saw the Kiang, or wild ass, on the open downs between Yeumtso and Gereë. The country about Chumulai is always indicated as the favourite ground of the Kiang, and I was told that it did not visit this part of Thibet except at the warmer seasons. In November it would be too cold for it hereabouts. The long ears, scanty mane, scanty and short tail, give this creature an entirely asinine appearance, and not at all the appearance of a horse. Dr. Hooker and I have forwarded complete skins of the male, female, and young colt to the Museum of the Asiatic Society, Calcutta, through Dr. O'Shaughnessy.

† Hares very abundant here.



any descent, we came upon a grassy plateau two miles long, the east end of which slopes to the south and drains into the Lachen, but it bore no marks of water-ways.

In the centre was a small Lake, the edges of which were then frozen, and this was the depository of all the remaining waters of the plateau, for there was no slope or outlet to the west. An examination of this small plateau gave me the first satisfactory explanation of the constant assertion of the Thibetans, that in travelling over the more level portions of their country "*there are no streams of water.*" The annual fall of rain and snow is represented as being exceedingly small in the aggregate, and never to be at all heavy, while the evaporation is very rapid.\* This with a sandy soil, and the existence of numerous depressions forming shallow Lakes, will account for the disposal of much of the Thibetan waters, and for the extreme difficulty of ascertaining the situation of streams, but except in the mountains, in which the valleys are said to be very narrow and to contain permanent water-courses, I believe there are no constantly running streams at all in Thibet. I can speak in this respect to the plateau extending north-west from the smaller one noted above, to the Kambajong range of hills, and which is certainly ten miles square. There is not a drop of running water in the whole of it. There is a water-course with a general north-west direction, which I went along from its origin for six miles; but it was perfectly dry, and the slope was quite trivial. The drainage from this plateau is to the north-west, and goes, I believe, into a feeder of the Arun—a Nipal river. This plateau of Cholamoo and Geree is bounded on the east by a broad flat spur from Donkiah, which terminates the Lachen valley to the east, to the north and north-east by the Kambajong range of mountains, and to the south by the hill of Bhomtso, and the smaller plateaux lying to the north of the rocky range which bounds the valley of the Lachen. Probable elevation of the plateau 17,500 feet; it is composed of yellowish sand and stone, pasture very scanty indeed. Antelopes and Kiang seen on it, and I fell in with a flock of four hundred very fine large sheep. They were hornless, generally black, or brown faced, and were tended by one man only without a dog. He walked slowly in the middle, keeping up a sort of grunting noise to the flock which

\* The Wet Bulb Ther. stood 22° degrees below the temperature of the air.





grazed and moved onwards whichever way he did. There was one remarkably fine ram among them; his fleece reached the ground, his back was painted bright red. The wool of these sheep is of a superior sort. The flesh we ate was flavourless, but short in the grain and tender. The flock belonged to Geree; I believe I never saw any one look so much surprised as the shepherd did when I rode up to him.

Ther. at Yeumtso, 6 P. M.  $36^{\circ}$ , at 8 P. M.  $29^{\circ}$ , radiating do.  $20^{\circ}$ .

*October 18th.*

6 A. M. Yeumtso. The Ther. fell during the night to  $5^{\circ}$ , radiating do. to  $2^{\circ}$ . Water in vessels on the tent table frozen to a mass of ice. Ther. at sunrise  $15^{\circ}$ . We move our camp to-day to the Cholamoo Lake, where we shall join it in the evening, going in the mean time to Bhomtso mountain five miles north of this, and 1,400 feet higher, total elevation about 18,000 feet. Hooker wishes to amend his geography by a careful round of bearings, and especially to see to the position of Chumulari. Reached Bhomtso or Bhomecha—elevation 18,500 feet—at 10 A. M. followed by a detachment of the Thibetan guard, who were very anxious for us to go direct to our camp. They felt the cold excessively, and finding us unwilling to accompany them set off themselves, leaving us to our own devices. Ther. at 11 A. M.  $44^{\circ}$ , Wet Bulb  $22^{\circ}$ , and strong breeze from the north-west cuttingly cold. No sickness or head-ache to-day, but walking brings on laborious breathing. We remained on Bhomtso till the afternoon, Hooker taking bearings with the Theodolite, and observations with the Barometer, the boiling point, the Wet Bulb, &c. &c. and had indeed a rare day of it. A great extent of Thibet was laid out before us without a cloud to obscure the view, and it was equally fine to the south. In the far south-west forty miles off we had a view of Kanchanjunga still the king of all the Sikim mountains, its north-east aspect being no less grand from Thibet than its southern one is from Darjeeling, although from the former it appears hemmed in by numerous lateral peaks and mountains of perpetual snow. Immediately south-west-south and south-east of us was a noble line of mountains formed by Chomiomo, Kanchanjhow and Donkiah, all 23,000 feet or more,\* and not more than six miles lineal distance. To the east and in line with the above, we saw a great range of perpetual snow mountains indicated

\* Donkiah misnamed "Powhunry," by Col. Waugh is measured 23,000.



as Chomulari by the Thibetan soldiers, and, as far as Hooker could calculate then, they occupied the position assigned to that celebrated mountain by Captain Turner.

What could exceed in grandeur such a galaxy of immense mountains as we had in view from Bhomtso to the south and east? Nothing that I know of. But the view to the north, north-west and north-east stretching into Thibet was quite as striking. After descending from Bhomtso, Hooker botanised the bed of the Lachen, and we found a bed of blue slate on the south side of the Lachen valley, which would be valuable for roofing if more accessible.

Before reaching our tents at Cholamoo it got quite dark, we had no guide to our camp, and instead of going to the eastern bank of the Lake where it was pitched, we kept the west side, going towards the Donkia mountain till we came upon snow. Here we found out our mistake by shouts from the opposite side, and had to retrace our steps to the outlet to enable us to cross over two miles of rocky and swampy ground in pitchy darkness; but we got in by 8 o'clock, all right, and very tired.

(To be continued.)

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*Influence of the Moon on the Weather.—By J. W. BEALE, Esq.,  
Agra College.*

At the desire of Mr. Middleton, the Principal of the Agra College, I have, during the past year, followed up the observations made by him in 1850 and printed in Journal CCXX. of the Society, with the view to determine whether the prejudice so universally received in India, especially by the Christian community, of the moon's influence in producing a change of weather, be correctly founded or otherwise.

The observations were made generally twice in a day, and sometimes oftener, when any change in the state of the weather seemed to require it. The reductions from the larger tables have been made exactly in the same way as in the former year, each lunation being divided into New-Moon, Full-Moon, second and last periods; each





period consisting of seven days, having the day on which the New or Full Moon fell, or the second or last quarter began, on the middle of the hebdomadal period, and having three days reckoned on each side of it, making it thus equal to seven days.

The number of days during which rain fell last year, exceeds the number of days of the former year, by 11, and the quantity by 5.4 inches; while the number of days which were cloudy without rain last year, exceeds the number of the year before by 45. The number of Storms recorded last year being double the number noted in the previous year.

Again, by referring to the accompanying Table No. 2, we remark as a curious fact that the number of rainy days in the New and Full Moon periods, and the number in the second and last periods, are very nearly equal; the number of days during which the east wind was prevalent in each pair of periods being also nearly equal to the number of rainy days in the same pair; while the number of cloudy days in each pair is double of the number of rainy ones in it, but the quantity of rain which fell during the second and last periods is almost double of the quantity in the New and Full Moon periods. This circumstance alone stands quite at variance with, and in fact opposed to, the result obtained by the observations made in the foregoing year, and would go far to negative the truth of the moon's influence, and to disprove the correctness of the prejudice, if the observations of a single year could be thought sufficient to do so. But time alone can prove this, and a series of observations extending over a number of years and made at various places, is necessary before we can be said to have arrived at any thing like certainty.

In conclusion I would add, that the data from which the reductions for the quantity of rain are made, were kindly furnished me by Mr. Middleton.





Table I.

Summary for each Period.	Cloud and Rain.		Quantity of rain in Inches.	Direction of Wind.							Variable Winds.	Storms.	
	* Cloudy days.	Rainy days.		East.	West.	North.	South.	N. E.	S. E.	N. W.			S. W.
13 New Moon Periods.	35	15	2.13	17	21	12	4	5	0	10	3	2. E. to W. 2. N. to W. 2. W. to N. 1. S. to E. 2. N. to N. E. 1. N. W. to S. 1. N. W. to W. 1. S. to S. E. 1. S. E. to E., ..... 12. W. to E. 2. E. to N. 5. W. to N. 1. N. to E., ..... 02. E. to W. 1. N. to W. 1. S. to E. 1. E. to N. 3. N. to E. 1. E. to S. 1. S. to W. 2. W. to E. 1. W. to S. 1. S. W. to W. 2. W. to S. W. 1 N. to N. W., ..... 01. E. to W. 2. W. to N. 2. N. to W. 3. N. to E. 1. W. to S. 1. W. to E. 1. W. to N. W., ..... 28	5 5 7 11
13 Second Pe- riods.	33	23	13.47	17	34	9	2	8	5	7	1	2. E. to W. 1. N. to W. 1. S. to E. 1. E. to N. 3. N. to E. 1. E. to S. 1. S. to W. 2. W. to E. 1. W. to S. 1. S. W. to W. 2. W. to S. W. 1 N. to N. W., ..... 01. E. to W. 2. W. to N. 2. N. to W. 3. N. to E. 1. W. to S. 1. W. to E. 1. W. to N. W., ..... 28	5 5 7 11
12 Full Moon Periods.	35	20	6.97	17	22	12	3	9	3	3	0	2. E. to W. 1. N. to W. 1. S. to E. 1. E. to N. 3. N. to E. 1. E. to S. 1. S. to W. 2. W. to E. 1. W. to S. 1. S. W. to W. 2. W. to S. W. 1 N. to N. W., ..... 01. E. to W. 2. W. to N. 2. N. to W. 3. N. to E. 1. W. to S. 1. W. to E. 1. W. to N. W., ..... 28	5 5 7 11
12 Last Pe- riods.	29	11	3.18	14	32	8	5	13	1	7	0	2. E. to W. 1. N. to W. 1. S. to E. 1. E. to N. 3. N. to E. 1. E. to S. 1. S. to W. 2. W. to E. 1. W. to S. 1. S. W. to W. 2. W. to S. W. 1 N. to N. W., ..... 01. E. to W. 2. W. to N. 2. N. to W. 3. N. to E. 1. W. to S. 1. W. to E. 1. W. to N. W., ..... 28	5 5 7 11
Grand Total,	132	69	25.75	65	109	41	14	45	9	27	4	51	28

Table II.

Summary.	Cloud and Rain.		Quantity of rain in Inches.	Direction of Wind.							Variable Winds.	Storm.	Haze.			
	* Cloudy days.	Rainy days.		East.	West.	North.	South.	N.E.	S.E.	N.W.				S.W.		
13 New Moon and 12 Full Moon Periods.	70	35	9.10	34	43	24	724	313	3	{ 4. E to W. 3. N. to W. 2. S. to E. 1. E. to N. 3. N. to E. 1. E. to S. 1. S. to W. 2. W. to E. 1. W. to S. 1. S. W. to W. 2. W. to S. W. 1. N. to N. W. 2. W. to N. 2. N. to N. E. 1. N. W. to S. 1. N. W. to N. 1. S. to S. E. 1. S. E. to E., 1. E. to W. 2. N. to W. 7. W. to N. 4. N. to E. 1. W. to S. 1. W. to E. 1. W. to N. W. 2. W. to E. 2. E. to N.,..... }					12	2
13 Second and 12 Last Periods.	62	34	16.65	31	66	17	721	614	1	{ 1. E. to W. 2. N. to W. 7. W. to N. 4. N. to E. 1. W. to S. 1. W. to E. 1. W. to N. W. 2. W. to E. 2. E. to N.,..... }					16	1
Grand Total.	132	69	25.75	65	109	41	1445	927	451						28	3

\* Days Cloudy without Rain.



*The Mausoleum of the Nuwabs Ali-Verdi Khan and Sooraj-ood-Dowlah, at Khooshbagh, near Moorshedabad. By Capt. F. P. LAYARD, 19th Regiment Bengal Native Infantry.*

On the right bank of the river Bhaguruttee, at a distance of about two miles below the city of Moorshedabad, surrounded by a low brick wall, and embedded in fine old trees and garden shrubs, stands the mausoleum of two men famous in the annals of the history of Bengal; one as much for his virtues and soldier-like qualities, as the other for his vices and the meanness of his nature.

These men were the Nuwab Ali-Verdi Khan Mohabut Jung, and his grand-nephew, Mirza Mahmud, who, on succeeding to the *musnud* of Bengal, assumed the title of Chiragee-ood-Dowlah,\* or, as he is more generally called by Europeans, Sooraj-ood-Dowlah.

The enclosure called Khooshbagh, containing the mausoleum with other buildings and out-offices attached, cover a space of nearly nineteen beegahs of land. From a statement made by the grand-daughter of Lootf-oon-Nissa Begum, the wife of Sooraj-ood-Dowlah, to Mr. J. E. Harrington, the Collector of Moorshedabad in January, 1791, it appears that an assignment of Sicca Rupees 305 per month was originally fixed by the Nuwab Ali-Verdi Khan on the collections of Bundardeh and Nawabgunge, in the Khas Talooks near Moorshedabad for the care and attendant expenses of the burial ground.

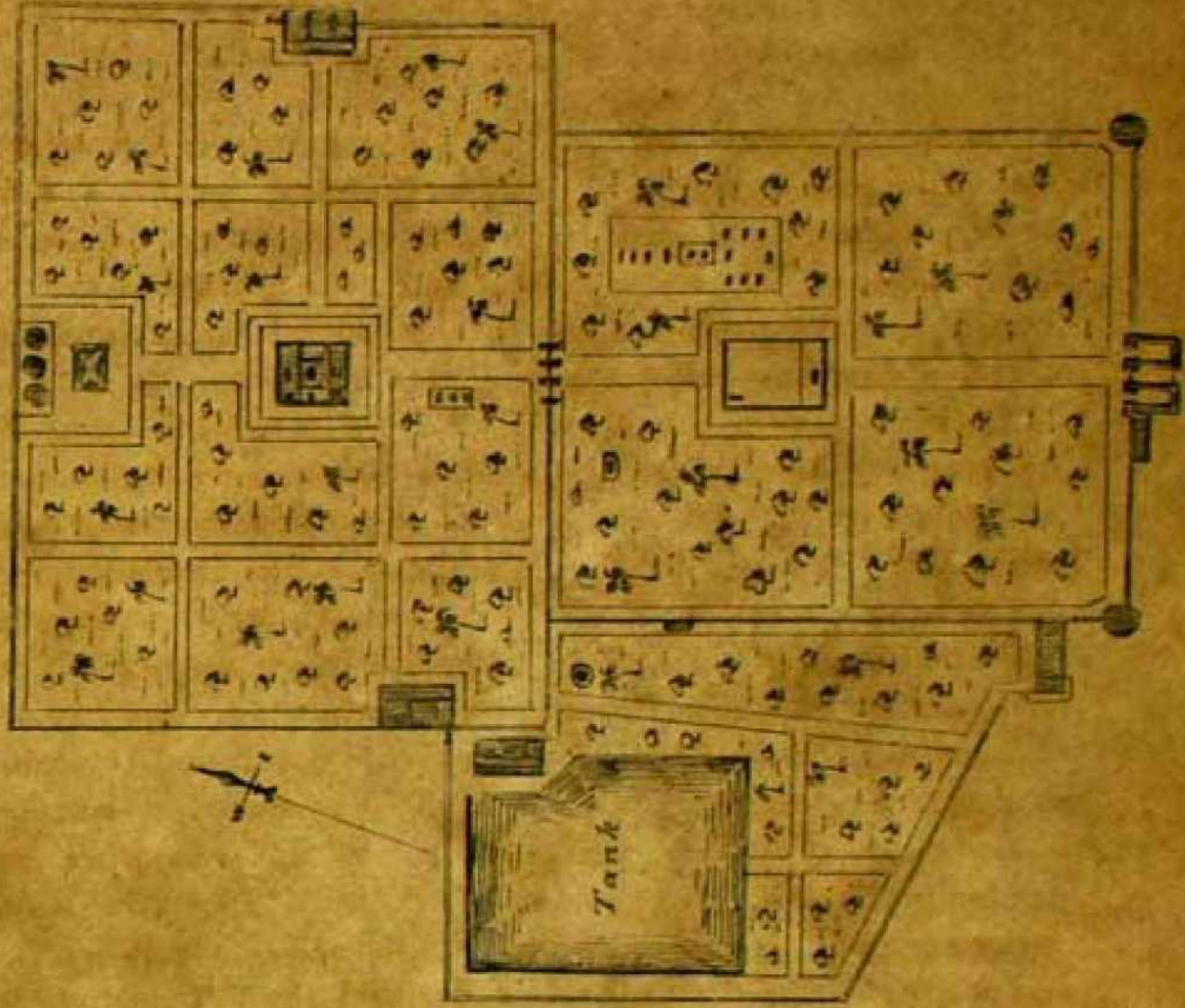
It would thus appear, that Khooshbagh was used as a cemetery previously to the death of Ali Verdi Khan, and its first establishment may no doubt be fixed, from the time of the decease of the good Nuwab's mother, who lies buried within a small elevated enclosed platform, in the centre of the outer quadrangle or garden, (*vide* Plan No. 1). This quadrangle may probably have constituted the entire space originally occupied by the cemetery, the grounds having been subsequently increased by Sooraj-ood-Dowlah on the death of his grand-uncle in 1756.

The grounds attached to the mausoleum, now consist of three separate enclosures, surrounded by walls varying in height from six to

\* Orme, Vol. II., page 48.



# PLAN of the GROUND and BUILDINGS attached to the MAUSOLEUM at KHOOSH BACH



## REFERENCES.

- a. Mausoleum (see Plan No II)
- b. Mosque & Heuz
- c. Khori Khanah
- d. Tikhlet Khanah
- e. Bythok Khanah
- f. Mussafir Khanah
- g. Tombs of a Son in Law & 2 Daughters of Sooraj-ood Dowlah
- h. Tomb of Kali Begum
- i. Tomb of the mother of Ali verde Khan
- k. Tomb of the Sister of D<sup>e</sup>
- l. --- of Nawab Bairam Jung
- m. --- of Nawab Mozaffir Jung
- n. --- of Rabia Begum
- o. Old Watergate & Guard House
- p. Bastions
- q. Wall pierced for Musquetry

Scale

0 20 40 60 80 100 feet

100 feet



thirteen feet. The outer quadrangle is entered by an old gateway with double iron-studded doors, and a dark guard-room on each side. In front of the gate, is a Ghát, which formerly led down to the river, only a few steps are now visible, the remainder having long since disappeared under the new formed alluvial soil, the stream being now nearly half a mile distant. This land is under cultivation for Indigo. According to Native report it is fifty years since the Bhaguruttee ran under the walls of Khooshbagh.

The wall facing the river is pierced for musquetry and flanked by octagon bastions, having approaches to their summits by flights of steps built in the wall.

The three enclosures are laid out as gardens, with neatly trimmed hedges bordering the walks. The flowers cultivated in the gardens are used in adorning the tombs of the Nuwabs and of the different members of their families scattered about the grounds. Many fine old jack and peepul trees, with here and there a graceful cocoanut, exclude the fierce ray of a tropical sun, and afford a cool and pleasant retreat for the devout, who frequent the tombs for prayer or meditation, during the heat of the day.

The inner face of the wall of the outer quadrangle, shows traces of its having been formerly painted in fresco in white and red stripes, but damp and neglect have nearly obliterated the colours. Many foundations of small dwelling-houses are still to be seen in this quadrangle; these no doubt at one time afforded shelter for the servants attached to the cemetery.

The tombs in this enclosure are 18 in number, the principal being those of the mother and sister of Ali Verdi-Khan (l & m Plate No. 1). These are enclosed, as before mentioned, by a wall, and raised on a platform; they, as well as all the tombs in Khooshbagh, with the exception of two, bear no inscriptions. On a second platform to the right of this, there are fifteen tombs of different members of the family, amongst them, are those of the Nuwab Bairam Jung (n 1 Plate 1) and of his father the Nuwab Muzuffir Jung (n 2 Plate 1), as also of Rabia Begum.

On the two first named tombs there are inscriptions: that on the tomb of Muzuffir Jung runs as follows:



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ اللَّهُ لَا إِلَهَ إِلَّا هُوَ الْحَيُّ الْقَيُّومُ لَا تَأْخُذُهُ سَنَةٌ وَلَا نَوْمٌ لَهُ مَا فِي السَّمَوَاتِ وَمَا فِي الْأَرْضِ مَنْ ذَلَّذِي يَشْفَعُ عِنْدَهُ إِلَّا بِإِذْنِهِ يَعْلَمُ مَا بَيْنَ أَيْدِيهِمْ وَمَا خَلْفَهُمْ وَلَا يُحِيطُونَ بِشَيْءٍ مِنْ عِلْمِهِ إِلَّا بِمَا شَاءَ وَسِعَ كُرْسِيُّهُ السَّمَوَاتِ وَالْأَرْضَ وَلَا يَئُودُهُ حِفْظُهُمَا وَهُوَ الْعَلِيُّ الْعَظِيمُ لَا إِدْرَاةَ فِي الدِّينِ قَدْ تَبَيَّنَ الرُّشْدُ مِنَ الْغَيِّ فَمَنْ يَكْفُرْ بِالطَّاغُوتِ وَيُؤْمِنْ بِاللَّهِ فَقَدْ اسْتَمْسَكَ بِالْعُرْوَةِ الْوُثْقَى لَا لَإِنْفَصَامَ لَهَا وَاللَّهُ سَمِيعٌ عَلِيمٌ اللَّهُ وَلِيُّ الَّذِينَ آمَنُوا يُخْرِجُهُم مِنَ الظُّلُمَاتِ إِلَى النُّورِ وَالَّذِينَ كَفَرُوا أُولَئِكَ هُمُ الطَّاغُوتُ يُخْرِجُونَهُمْ مِنَ النُّورِ إِلَى الظُّلُمَاتِ أُولَئِكَ أَصْحَابُ النَّارِ هُمْ فِيهَا خَالِدُونَ

سنة ١١٩٦  
اللَّهُمَّ إِنِّي أُوَدِّعُكَ هَذَا أَلَا قَرَأَ رَبِّكَ وَبِالتَّوْبَةِ وَالْإِسْلَامِ وَأَنْتَ خَيْرُ مُسْتَوْدِعٍ عَلَى عِنْدِ يَسْئَلُهُ مَنْكَرٌ وَنَكِيرٌ فِي الْقَبْرِ بِرَحْمَتِكَ يَا أَرْحَمَ الرَّاحِمِينَ وَصَلَّى اللَّهُ عَلَى مُحَمَّدٍ وَآلِهِ أَجْمَعِينَ اللَّهُمَّ يَا أَرْحَمَ الرَّاحِمِينَ أُوَدِّعُكَ يَقِينِي هَذَا وَتَذَاوِي دِينِي وَأَنْتَ خَيْرُ سَوَدَعٍ وَقَدْ أَمَرْتَنِي بِحِفْظِ الْوَدَائِعِ وَ عَلَى وَقْتُ حُضُورِ مَوْلَى يَا أَرْحَمَ الرَّاحِمِينَ رَضِيتُ بِاللَّهِ وَبِالْإِسْلَامِ دِينًا وَبِمُحَمَّدٍ نَبِيًّا وَبِالْقُرْآنِ كِتَابًا وَلِكِعْتَةِ فَلَهُ وَتَعَالَى إِمَامًا بِالْحَسَنِ وَالْحُسَيْنِ وَعَلَى بْنِ الْحُسَيْنِ وَمُحَمَّدٍ الْبَاقِرِ وَجَعْفَرٍ الصَّادِقِ وَمُوسَى الْكَاسِمِ وَعَلَى رِضَا وَمُحَمَّدٍ الْجَوَادِ وَعَلَى إِبْرَاهِيمَ الْهَادِي وَالْحَسَنِ الْمَظَرِ الْهَادِي وَمُحَمَّدِ بْنِ الْحَسَنِ صَاحِبِ الزَّمَانِ صَلَوَاتُ اللَّهِ وَسَلَامُهُ عَلَيْهِ وَ عَلَيْهِمْ أَجْمَعِينَ

سنة ٢٤  
اللَّهُمَّ إِنِّي أُوَدِّعُكَ هَذَا أَلَا قَرَأَ رَبِّكَ وَبِالتَّوْبَةِ وَالْإِسْلَامِ وَأَنْتَ خَيْرُ مُسْتَوْدِعٍ عَلَى عِنْدِ يَسْئَلُهُ مَنْكَرٌ وَنَكِيرٌ فِي الْقَبْرِ بِرَحْمَتِكَ يَا أَرْحَمَ الرَّاحِمِينَ وَصَلَّى اللَّهُ عَلَى مُحَمَّدٍ وَآلِهِ أَجْمَعِينَ اللَّهُمَّ يَا أَرْحَمَ الرَّاحِمِينَ أُوَدِّعُكَ يَقِينِي هَذَا وَتَذَاوِي دِينِي وَأَنْتَ خَيْرُ سَوَدَعٍ وَقَدْ أَمَرْتَنِي بِحِفْظِ الْوَدَائِعِ وَ عَلَى وَقْتُ حُضُورِ مَوْلَى يَا أَرْحَمَ الرَّاحِمِينَ رَضِيتُ بِاللَّهِ وَبِالْإِسْلَامِ دِينًا وَبِمُحَمَّدٍ نَبِيًّا وَبِالْقُرْآنِ كِتَابًا وَلِكِعْتَةِ فَلَهُ وَتَعَالَى إِمَامًا بِالْحَسَنِ وَالْحُسَيْنِ وَعَلَى بْنِ الْحُسَيْنِ وَمُحَمَّدٍ الْبَاقِرِ وَجَعْفَرٍ الصَّادِقِ وَمُوسَى الْكَاسِمِ وَعَلَى رِضَا وَمُحَمَّدٍ الْجَوَادِ وَعَلَى إِبْرَاهِيمَ الْهَادِي وَالْحَسَنِ الْمَظَرِ الْهَادِي وَمُحَمَّدِ بْنِ الْحَسَنِ صَاحِبِ الزَّمَانِ صَلَوَاتُ اللَّهِ وَسَلَامُهُ عَلَيْهِ وَ عَلَيْهِمْ أَجْمَعِينَ



He was the Naib or Deputy of the Nuwab Moobarick-ood-Dowlah, the fourth in succession from the traitor Meer Jaffier placed on the musnud of Bengal by Lord Clive after the battle of Plassy, and a person of some consequence during the time of Warren Hastings. He died in A. H. 1194 (A. D. 1797).

The Inscription on the tomb of his son Bairam Jung is as follows :

بسم الله الرحمن الرحيم  
الله لا اله الا هو الحي القيوم لا تاخذه سنة ولا نوم له ما فى السموات  
وما فى الارض من ذلك لذي يشفع عنده الا باذنه يعلم ما بين ايديهم  
وما خلفهم ولا يحيطون بشئ من علمه الا بما شأ وسع كرسيه السموات  
والارض ولا يؤوده حفظهما وهو العلي العظيم •  
عمدة الملك اشرف الدوله زين سراى فذا چورخ بنهفت  
سال رحلت زغيب بادل راز رضي الله عنه هاتف گفت  
سنه ۱۲۰۲

He died in A. H. 1269 (A. D. 1785).

Rabia Begum was a daughter of Haji Mahommed, the brother of Ali-Verdi Khan, who was Prime Minister at the Court of the Nuwab Sujah Khan in 1725.

A small raised tomb to the left of the centre platform, marks the resting place of Kali Begum, (V. K Plan 1), the daughter of Nuwab Mahommed Ameen Khan, and niece of Ali-Vardi Khan, probably by his wife's side, as Ali-Verdi is said to have had only one brother.

Passing through a neat three-arched gateway, the mausoleum enclosure is entered ; it is like the outer quadrangle in its arrangement of trees and garden shrubs, but contains besides the mausoleum, a mosque and two buildings allotted to the establishment kept up by Government for the care of the tomb. One of these buildings, (*vide* Plan 1) is the kari-khanah or store-house, the other, the tubbeel-khanah or treasury, but portions are also occupied by certain ladies, the descendants of Ali-Verdi's family.

On entering the gate, three graves are shown on the left, in which are said to have been buried a son-in-law, and two daughters of Sooraj ood-Dowlah, but according to a written statement left by the



grand daughters of the Nuwab, dated in December 1790, a copy of which is preserved amongst the records, in the hands of the mookhtyar in charge of the cemetery ; he is said to have had only one child, a daughter, named Umoot-is-Saira Begum, who died during the life time of her mother Lootf-oon-nissa Begum. The graves may, however, be the resting places of this lady and one of her four daughters by Nuwab Assud Ali Khan, whom she married in 1767.

The mausoleum is a neat brick building, with little of oriental architecture in its form, excepting the four small minarets at the corner, and its projecting eaves (*vide* Plan II.). It is raised two feet from the ground, and approached by small flights of steps to the east and west. The principal portion, in which are the tombs, is a square of about 37 feet divided into an enclosed verandah on the east and west side, the whole length of the building, and two smaller verandahs on the north and south, leaving thus a square room in the centre which contains the tomb of Ali-Verdi Khan. The tomb rooms are again closed in by a verandah with five arched openings in each face.

All the tombs in the mausoleum are covered with palls of dark cloth, spangled with flowers and other ornaments in gold and silver leaf ; lights are continually kept burning, and fresh flowers daily strewed on the graves.

Ali-Verdi Khan died at Moorshedabad at the age of 80, at 2 P. M. on Saturday the 9th Rujub A. H. 1169 (A. D. 9th April, 1756), and was buried at 2 o'clock, on the morning of the 10th. His first resting place does not appear to have been in the mausoleum, but on the centre platform in the outer quadrangle near the grave of his mother. On the mausoleum being completed by Sooraj-ood-Dowlah, the body was disinterred and laid in its present tomb (a. Pl. II.) under the black stone, which is said to have burst assunder with a loud report on being lowered over the corpse of the aged Nuwab. The crack is still shown to visitors !

Ali-Verdi, according to tradition at Moorshedabad, is said to have died of a sickness called Istiská (استسقا), which I understood to indicate dropsy, but which was described to me, to have been a disease of a most painful and lingering nature, where an unsatiable and unquenchable craving for water, carried off its victim in great agony even in the act of drinking.



The second tomb in importance, is that of the Nuwab Sooraj-ood Dowlah of "Black Hole" notoriety. (c. Plan II.) The death of this vicious prince, who perished in the 20th year of his age, in July, 1757, is fully recorded in Orme's History of Hindustan,\* but differs somewhat from the tradition amongst the natives at Moorshedabad. Orme declares the guards of Meerun, the son of Meer Jaffier Ali, to have received with alacrity, their master's orders to slay their prisoner, whereas it is said, that, on Meerun directing the guard to bring him the head of the deposed prince, they all refused, with the exception of one man named Mahomed Beg, a fosterbrother of Sooraj-ood Dowlah, who in accepting the cruel mission added these words: "I will erase from the face of the world the picture of Sooraj-ood Dowlah." He then proceeded, scimitar in hand, into the presence of his victim, who seeing him thus armed said, "O Mahomed Beg! are you come to kill me, or do you bring a message from Meerun?" The wretch replied, that he was the bearer of no message, but came to kill him, and immediately severed his head from his body. The mangled remains were afterwards paraded through the streets of the city on an elephant, and the murderer† highly rewarded by Meerun.‡

The tomb in the centre of the west verandah, (b. Pl. II.) contains the remains of the wife of Ali-Verdi Khan, who was known by the title of the Nawab Begum, but her name, or that of her father, does not appear to be mentioned in any History of Bengal which I have had the opportunity of consulting. She is said to have been the only wife of Ali-Verdi, and on one occasion to have played an important part in the eventful reign of her lord, during his wars with Boscar Rao, the Maharhatta, when the latter and all his attendants were treacherously slain in a tent, at a conference with Ali-Verdi, under the safeguard of an oath on the Koran.§

To the left, in the same verandah (h. Pl. II.), is the tomb of Oomut-il Mehndi, called the *Nowasi*, being the grand-daughter of Sooraj-ood Dowlah. She married Syud Mahomed Hussein Khan, a son of Syud Hussein Khan Bahadoor Selabut Jung.

\* Vol. 2nd, page 184.

† Mahomed Beg died at Moorshedabad, where his tomb has been pointed out to me.

‡ Stewart's account is somewhat similar to this. § Orme, vol. 2nd, p. 36.



In the south verandah (g. Pl. II.) lies Lootf-oon-Nissa Begum, the wife of Sooraj-ood Dowlah, who died on the 5th Assin A. H. 1197, corresponding to 18th September, 1790, A. D. This lady was the companion of her husband in his flight from Moorshedabad to Rajemahal after his defeat at Plassey. On the murder of the Nuwab, she, together with the aged wife of Ali-Verdi Khan, and her four grand-daughters Shuruf-oon Nissa,\* Usmut-oon Nissa,† Sehkeenah‡ and Oomut-il Mehndi were sent to Dacca by the Nuwab Meer Jaffier Ali Khan, but after the expiration of ten years were recalled by the Naib Muzuffir Jung in the reign of Moobarick-ood Dowlah. Mr. Forster, writing in 1781, mentions the widowed Begum as frequently visiting the tomb of her deceased husband and performing ceremonies of mourning to his memory. She subsequently had charge of the cemetery, with a monthly allowance for its care, and that of the tomb of Hybut Jung at Patna, granted or rather re-allowed by Government of Sa. Rs. 305, with a further annual pension of Sa. Rs. 1,000, which she obtained by personally representing her case to Warren Hastings in Calcutta in 1787. These allowances were continued to her grand-daughters, after her death, and have descended to the heirs of the family, now in charge.

In the east verandah, are the tombs of Mohut-ood-Ulli, and his son (e. and f. Pl. II.), cousins of Sooraj-ood Dowlah, also of another cousin of this Nuwab, by name Mirza Mehndi. (d. Pl. II.)

Many of the records of Khooshbagh having been stolen by a former mookhtyar of the gardens, who fled to the upper provinces with the accumulated arrears of many months' salary belonging to the establishment, it is now difficult to discover, what posts these latter named individuals held, nor do their names appear in History.

At the western extremity of the mausoleum garden, stands the small neatly built mosque and fountain frequented by the Moollahs of the cemetery at the prescribed hours for prayer.

The third enclosure (*vide* Plate I.) contains a tank on the borders of which, stands a little dwelling house (9) called the Bythuk Khanah,

\* Married afterwards to Watijud-ally Khan, son of Abbud Ali Khan.

† Married afterwards to the Nuwab Syud Ahmud Khan Bahadoor Hosear Jung, son of Nuwab Syud Mahomed Khan Bahadoor Shair Jung.

‡ Married to Meerza Mahomed son of Meerza Mahomed Ali.





STUCCO HEAD, EXHIBITED BY MAJOR BAKER.

T. Blöck, Asiatic Lith. Press 8, Hare St. Calcutta.



inhabited by the Moonshi and other servants of the tombs. Here is also the Mussafir Khanah or resting place of travellers, (h. Pl. I.) where also many faqueers and pilgrims are fed at certain times, from the funds of the mausoleum. A fine old deep well may also be seen in this enclosure, but it is no longer used, the water having been polluted many years ago, according to native report, by a faqueer having been accidentally drowned in it, one dark night : since then a parapet wall has been built round it.

The city of Moorshedabad, is said, in former times, to have extended beyond its present limit on the right bank of the river, as far as Khooshbagh. Many palaces, houses and gardens of Nuwabs and nobles then occupied the right bank, which was in those days, the most populous part of the city. Little can now be traced of these buildings amongst the luxuriant and tangled jungle. With the exception of the new palace and a few buildings immediately on the bank of the river, Moorshedabad is now truly a wilderness of ruins and forest.

Khooshbagh with its neatly kept walks, noble trees and parterres of brilliantly-coloured flowers, banishes all sombre thoughts in connection with the object of its establishment. A few hours in this quiet nook where repose the ashes of men, who have played such eventful parts in the history of our empire in the east, might be supposed to afford much interest ; but few Europeans visit the spot, and few even, though resident at the neighbouring station of Berhampore, five miles distant, are aware of its locality !

*Notice of two heads found in the Northern : Districts of the Punjab, with drawings, by Mr. W. JACKSON, Vice-President of the Society.*

Plates XIX. and XX., are drawings from the two heads mentioned in the Proceedings of October last, as having been exhibited at a meeting of the Society by Major Baker of the Engineers : they are said to have been found near Peshawur ; the two heads are of most opposite characters and the contrast shews to advantage the peculiarities of each.

Plate XIX., is evidently a head of the Boodhistic form ; the hair plaited all over and turned up in a knot at the very top of the head ;—the



eyelids heavy ; the eyes but little open, and sloping upwards towards the ears ; the nose flat and thick ; the mouth large with thick flat lips ; the ears very large and flat, with the lobes drawn down to a hideous extent : the expression of the face stolid and heavy : the material of which this head is composed is a white stucco of a very friable nature ; the workmanship is coarse, and the modelling of the head incorrect.

Plate XX., again is of a superior character in every respect ; the eyes open and intelligent ; the nose well formed ; and the nostrils open and well articulated ; the upper lip short ; the lips well and sharply defined ; and the mouth bearing a pleasing and intellectual expression ; the head too is correctly modelled, shewing some knowledge of the art of sculpture ; the ears are concealed by the full curls of the hair, which hangs loosely on each side of the head, the curls being well and sharply executed ; on the head is a cap or fillet ; the two sides being apparently connected by the principal band which goes round over the forehead ; but the upper part open, allowing the hair to appear and fall over the band just above the forehead ; the sides of the cap are divided into lozenge-shaped projections from the surfaces representing some kind of ornament ; where these sides join the band or fillet, I think some thing has been broken off ; the countenance is handsome and pleasing in its expression, either in profile, or in full face ;—the material is a dark stucco or cement, not so easily broken as that of Plate XIX., and of better and finer ingredients ; indeed the sharpness of the work is surprizing considering its antiquity.

I cannot conjecture without more data what or whom this head No. 2, is designed to represent ; but it is evidently not a Hindu head ; and on comparing it with the heads on the early Bactrian coins, there appears to be a great resemblance in general character ; sufficient to induce me to think it belongs to that period. The expression of the face is somewhat of a Greek cast, but it is not a pure Greek countenance ; if the spot on which it was found is known, I should think that other portions of the building it has belonged to might be discovered ; it is not probable that a single figure should be made of such weak materials ; and from the breakage at the top and back of the head I think it must have been attached to a wall of some building ; this is the more probable from the position of the



head which is not erect but turned on one side; and the ornamental work on the left side of the cap, is not found on the right side; the right side was therefore probably concealed.

It is very desirable that further enquiry should be made for a few more fragments, in the spot where this head No. 2, was found; the head in Plate XIX., is common enough; and has evidently no connection with the other.

*Has Sa'dy of Shyráz written Rékhtah verses?—By A. SPRENGER, Secretary of the Asiatic Society of Bengal.*

It has been asserted in the *Journal Asiatique* IV. Série, Vol. I. p. 1 and Vol. II. p. 361, that the celebrated author of the *Gulistán* (died A. H. 691) has written *Rékhtah* verses. The subject appears to be of sufficient interest to justify the publication of the original passages which bear on it. The assertion rests on a passage in the *Tadzkirah* of Qáyim, which was compiled in A. H. 1168, and is called مخزن نكات (the title is a chronogram). But Gurdézy who wrote a *Tadzkiráh* in 1165, that is to say, three years before Qáyim most emphatically contradicts this assertion, which in those days seems to have been popular, and he points out the true author of the verses ascribed to Sa'dy Shyrázy. After these two *Tadzkirahs* had been compiled, Myr Taqyy and Shórish wrote short biographies of *Rékhtah* poets, and both contradict this statement.

Qáyim says:—

طبقه اول اتفاق بعضی از مورخین بر آنست که چون حضرت  
شیخ سعدی شیرازی قدس الله روحه در هنگام سیر و سیاحت  
بطرف کجرات تشریف آوردند مجاورت سومنات چنانکه در نسخه  
بوستان خودش ایمائی بر آن فرموده اند کردند و لختی بر زبان این  
دیار وقوف یافته یکدو بیت ریخته که بعد ازین مرقوم خواهد شد  
برسبیل تفنن بقید نظم در آورده بعد ازان حضرت امیر بر همان بنا طرح  
ولغزایی بسیار بکار بردند هرچند سلیقه سخن سنجی آنوقت دور  
از فصاحت ریخته گویان حال است و از عبارات غیر مانوس مالا مال



لیکن بپاس طبیعت مشتاقان هرجذس سخن دو سه چهار بیت  
ازان ابیات تبرکاً و تیمناً درین مقام قلمی میگردد و از آثار و احوال  
این هردو بزرگوار چه نویسد که مورخان سلف در کتب تواریح  
متداوله ضبط نموده اند و اظهر من الشمس و ابین من الیمس است  
سعدی

ای مردمان شهر شما کتنی بری بهه ریت هی  
هی هی نمی پرسد کسی پردیسیا ماریت هی  
سعدی طرح انگیزته شهد و شکر آمیزته  
در ریخته در ریخته هم شعر هی هم گیت هی

"*First Period.* Some historians agree in the opinion that when the Shaykh Sa'dy Shyrázy in his travels to Gujrát resided at Samnát—he alludes to his stay there in his Bostán—he became slightly acquainted with the language of the country and composed one or two Rékhtah verses, which will be quoted hereafter. Subsequently the Amyr (Khosraw) has in the same manner composed many logogriphs in Rékhtah, but the style of that time is very different from the style of the poets of our age, and there occur many idioms which are no longer in use. But for the sake of those who take an interest in these matters, three or four verses are inserted here. As the biographies of these two great poets occur in well known historical works, there is no need of recording them here.

"*Sa'dy* : O men! what a bad fashion is this in your town, alas no one enquires if a stranger be killed. Sa'dy has given you a verse\* and has mixed sugar and honey. He has put pearls into the Rékhtah idiom; and this is a poem as well as a song."

Fath Ayy Khán Hosayny Gurdézy says :

سعدی دکنی از شعرای قرار داده دکن است و آنکه بعضی اعزه را  
بسبب اتحاد تخلص مغالطه افتاده ریخته‌های سعدی دکنی را از عدم

\* *Tarh* is a technical term which is used in assemblies of poets (Moshá'arah) and it means the verse which is given, and in the metre and rhyme of which all the members of the Moshá'arah are expected to make verses for their next meeting.



اعتنا و قلت تتبع بنام سعدی شیرازی مرقوم ساخته اند ناشی  
از جهل و تسفه است و من ادعی فعلیه السند  
همنا تمنکون دل دیا تمنی لیا اور دکھ دیا  
تم یہ کیا ہم وہ کیا ایسی بہلی بہ ریت ہی

“Sa'dy Dakany is one of the poets who lived in the Deccan. The mistake which some persons have made of ascribing the Rékhtah compositions of Sa'dy Dakany to Sa'dy Shyrázy, owing to the identity of the takhalluṣ and their own rashness and want of research, has arisen from ignorance and stupidity. Those who make such an assertion ought to prove it. Specimen of Sa'dy Dakany's poetry: ‘I have given thee my heart, thou hast taken it and hast given me pain in return. Thou hast done this, I have done that, this is a good fashion!’”

The passage in Myr Taqyy runs :

سعدی دکھنی راست و آنچه بعضی این را شیخ سعدی رحمت اللہ علیہ  
گمان بردہ اند خطا است

همنا تمنکودل دیا تمنی لیا اور دکھ دیا  
تم یہہ کیا ہم وہ کیا ایسی بہلی بہہ ریت ہی  
دو نین کے کہپر کروں رو رو تجوں دل کو بہروں  
پیش سگ کویت دھروں پیاسا نجاوے پیت ہی  
سعدی غزل انگینختہ شیر و شکر آمینختہ  
در ریختہ در ریختہ ہم شعر ہی ہم گیت ہی

“Sa'dy Dakany is the author of the following verses ; they have by some persons been ascribed to the Shaykh Sa'dy, but this is an error : ‘I have given thee my heart, thou hast taken it and hast given me pain in return. Thou hast done this, I have done that, this is a good fashion ! I make cups of my two eyes, crying, crying, I wither away ; I will give full sway to my sentiments, I will place (the two cups) before the dog of thy street that he may not remain thirsty, this is love (or that he may drink). Sa'dy has given you a verse and has mixed sugar and honey. He has put pearls into the Rékhtah idiom, and this is a poem as well as a song.’”



Shórish says :

سعدی نامش معلوم نیست وطنش دکن است ازوست  
همنانے تمکو دل دیا تمنے لیا اور دکھ دیا  
تم یہہ کیا ہم وہ کیا ایسی بہائی یہہ ریت ہی

“Sa'dy, his name is not known, he was of the Deccan, this verse is by him : I have given thee my heart, &c.” The specimens contained in the three Tadzkirahs appear to be the disjecta membra of one Ghazal.

I leave it for the Reader to judge whether the assertion is borne out that Sa'dy Shyrázy has written Rékhtah poetry. I must however make two remarks ; first, that on comparing the Tadzkirahs of Qáyim and Gurdézy, it does not appear that the former knew the labour of the latter, though Gurdézy wrote three years sooner. Qáyim distinctly denies every knowledge of Gurdézy's Tadzkirah, saying that no Tadzkirah of Rékhtah poets had ever been written ; secondly, that we have only the rough, incomplete copy of Qáyim's Tadzkirah (it is preserved in Moty Ma'hall library at Lucnow) and there is much reason to believe that he never completed it or made a fair copy and published it. Should he have given up the work on finding that Gurdézy had already written a Tadzkirah ? At all events it cannot be said that Qáyim intended to contradict the statement of his predecessor ; nor can a book on which the author has not bestowed the last cares, be considered as high an authority as if he had done so.

I take this opportunity of adding some specimens of early Rékhtah poetry. Qáyim says that Amyr Khosraw has written Rékhtah verses, and that he is the author of Rékhtah logogriphs. He quotes two verses and no riddles. I give one of the verses quoted by Qáyim and the whole Ghazal, from which the other verse is taken and some specimens of riddles, though it is certain that nine-tenths of the riddles ascribed to him are of much more recent date.

ز حال مسکین مکن تغافل درائی نینان بنائی بتیان  
کہ تاب ہجران ندارم ای جان نلیہو کاھے لگائے چہتیاں  
چو شمع سوزان چو ذرہ حیران ہمیشہ گریان بعشق آن صبا  
نہ نیند نینان نہ انگ چینان نہ آپہی آوے نہ بھیجے پتیاں



شبان هجران دراز چون زلف و روز وصلش چو عمر کوتاه  
 سکهی بیا کو جو می نه دیکهون تو کیسی کاٹوں اندھری رتیاں  
 یکایک از دل بصد فریبم به برد چشمش را و تسکین  
 کسے پڑی ہی جو جا سناوے پیارے پیو کو ہماری بتیاں  
 بحق روز وصال محشر کہ داد مارا فریب خسرو  
 درائے راکھوں سمیت ساجن جو کھنی پاؤں دو بول بتیاں  
 زرگر پیری چو ماہ پارا کچھ گڈھی سنوارے پکارا  
 نقد دل من رہود و بشکست آخر نہ گڈھا نہ کچھ سنوارا

“Do not neglect the condition of this poor man, turning away your eyes from me and making excuses.

As I am unable to endure the pangs of separation, O beloved! why do you not press me sometimes on your breast?

I burn like a lamp, I am confused like a moth, I am constantly crying out of love for that moon.

No sleep comes into my eyes, nor rest into my body; as neither she comes herself nor sends a letter.

The nights of separation are long like her ringlets, and the days of meeting her are short as life.

O friend (or attendant)! if I do not see my beloved, how shall I spend the dark nights?

Suddenly her eye has stolen from my heart by a hundred deceits, peace and rest.

Who will be kind enough to report to my beloved what I say?

I swear by the day of resurrection, O Khosraw, that as she has deceived me, I will conceal my beloved in my bosom if I have an opportunity to say two words to her.”

The other verses run—

“The daughter of the goldsmith, who resembles a piece of the moon, when at work making and mending jewelry called me; she has taken away and broken my heart, and in the end she has neither made nor mended it.”

I must not neglect to mention that a translation of the above Ghazal is in Garcin de Tassy's excellent *Histoire de la littérature Hind.* I. p. 301. The following are specimens of Khosraw's riddles transcribed from a MS. of the Tóp-Khánah library at Lucnow.



پہیلی حمد الہی  
سب کوئی اس کو جانے ہی      پر ایک نہیں پہچانے ہی  
آٹھ دھڑی میں لیکھا ہی      فکر کیا اور دیکھا ہی

*Riddle in praise of God.* "Every one knows of him but no one is acquainted with him. He who reflects and thinks during the scales (i. e. watches or the 24 hours) has seen him."

پہیلی نعت میں حضرت رسول صلی اللہ علیہ وسلم کی  
ایک پرکھ ہی دئی سنوارا      دنیا کا نستارن ہارا  
واکی چرنون لاگ رہو      زیادہ بچن نہ مہسے کہو

*The Prophet.* "There is a man made by God, he is the saviour of the world, remain attached to his feet, and say no more."

خدا کی تعریف میں  
سب سکھین کا پیا پیارا      سب میں ہی اور سب سون نیارا  
واکی آن مجھے یہہ بہا      جاکی ہی بن دیکھی چا

*God.* "He is the dearest of friends, he is in all, and distinct from all, his ways I like, and though I have not seen him, I have a longing after him."

پہیلی چراغ کی  
تیلی کا تیل کھارکا ہندا      ہاتی کی سوند نواب کا جھندا

*Lamp.* "The oil of the oilman, an earthen-ware vessel of the potter, the trunk of an elephant, the flag of a Nawáb."

پہیلی خربزہ  
دس ناریکا ایکھی نر      بستی باہر واگا گھر  
پیٹھ سخت اور بیدت نرم      منہ میٹھا تاثیر گرم

*Melon.* "Ten women, one man, it lives outside the village, the back is hard, the belly soft, it sweetens the mouth and is warm in its effects."



بہیلی حلالخور  
کماٹی اپنی پھینک دی اور جی پر نہیں ملال  
وہی کہوں ہٹ جات ہیں جو روزی کھائی حلال

*Sweeper.* "He throws away his earnings (i. e. dirt) yet he is not disgusted; why do people avoid him, though he eats his lawful earnings." (The last miçra' is a play on the word Halál-Khór a sweeper.)

Leaving the other riddles which I had copied for a separate article, I will mention another little work of Amyr Khosraw of which no mention is made by Qáyim. This is a Niçáb that is to say a rhymed vocabulary in Hindee, Persian and Arabic, intended to be learned by-heart by children. It is commonly called Kháliq Báriy from the initial words. The author mentions his name and explains its meaning not in a very clear manner:

مولوی صاحب سرن پناہ گدا بھکاری خسرو شاہ

The vocabulary consists of near 200 verses, and is in various metres, with a view of illustrating them. The following is a specimen:

شرم حیا در ہندی لاج حاصل کھئے باج خراج  
طالع بخت جو کھئے بھاگ لحن سرود ترنم راگ

"Sharm (shame) is the Persian for the Arabic Hayá and lāj is the Hindee; and háçil, and bāj in Persian and Kharáj in Arabic are synonymous, and mean public revenue. Tāli in Arabic, bakht in Persian and bhág in Hindee mean destiny. Lahn and tarannum in Arabic, sarúd in Persian and rág in Hindee mean a tune."

The first Urdú poet after Myr Khosraw whom Qáyim mentions is Núry, a friend of Faydhy and consequently a contemporary of Akbar, he says that he has written only two or three Ghazals in Rékhtah and mentions only one verse.

ہرکس کہ خیانت کند البتہ بترسد  
بیچارہ نوری نکرے ہی نہ دَرے ہی

"Every person who acts deceitfully is no doubt afraid. Poor Núry has not done any thing wrong and does not fear."

After Núry follows Mohammad Afdhal in Qáyim's list. It seems however that it was 'Abd Allah Qotobsháh (came to throne of Golconda in A. H. 1020=A. D. 1611) who first patronized and thereby raised Rékhtah poetry.



*Meteorological Observations kept at the Rangoon Field Hospital, Lat. 16° 47' N. Long. 96° 13' 27" for the Month of May, 1852.*  
*Elevation of the Hospital above the level of the sea about 40 feet; distance from the river about one mile.*

Date.	SUNRISE.					9 A. M.					NOON.		
	Thermometer.		Barometer.	Force and direction of Wind.	Aspect of Sky.	Thermometer.		Barometer.	Force and direction of Wind.	Aspect of Sky.	Thermometer.		Barometer.
	Wet.	Dry.				Wet.	Dry.				Wet.	Dry.	
May													
8th	76	79	No instrument.	Calm.	Cir.-strati.	77	98	..	W. light.	Cloudy.	76	96	..
9th	76	79	Ditto.	Ditto.	Cir.-cumuli.	75	88	..	Calm.	Cirri.	71½	94½	..
10th	74	77	Ditto.	Ditto.	Cumuli.	78½	87	..	S. W. light.	Cumuli.	79½	91	..
11th	75	78	Ditto.	Ditto.	Strati.	76	78	..	E. do.	Cir.-strati.	77	85	..
12th	77	78	Ditto.	S. light.	Ditto.	75	76	..	S. E. fresh.	Strati.	79	83	..
13th	78	80	Ditto.	S. E. do.	Cum.-strati.	80	87	..	Ditto.	Cumuli.	78½	84	..
14th	77	79	Ditto.	Ditto.	Cir.-strati.	80	86	..	Ditto.	Ditto.	79	85	..
15th	78	79	Ditto.	Ditto.	Strati.	80	83	..	S. E. light.	Cum.-strati.	79	80	..
16th	73	74	Instrument arrived.	Calm.	Cir.-strati.	76	79	30.	Ditto.	Ditto.	78½	85	30.
17th	76	77	29.96	Ditto.	Cum.-strati.	77	82	30.	S. W. do.	Cir.-strati.	81	89	29.95
18th	75	76	.95	Ditto.	Cirri.	79	84	29.97	Ditto.	Cumuli.	78	83	29.93
19th	76	77	.94	Ditto.	Hazy.	78	82	.97	Ditto.	Ditto.	79	82	.95
20th	76	77	.93	S. light.	Cir.-strati.	80	83	.95	S. do.	Ditto.	78	82	.93
21st	75	76	.91	S. b. W. do.	Cumuli.	78	83	.93	Ditto.	Ditto.	80	87	.91
22nd	75½	76½	.88	W. S. W. do.	Cir.-strati.	77	82½	.92	S. W. do.	Cir.-strati.	80	87½	.90
23rd	75	76	.90	S. do.	Strati.	79½	81½	.92	Ditto.	Cumuli.	80	87	.90
24th	77	77½	.91	N. W. do.	Ditto.	78½	84	.95	N. W. do.	Strati.	80	84	.92
25th	75	76	.91	Ditto.	Ditto.	77½	79½	.94	Ditto.	Ditto.	79	82	.91
26th	76	77	.88	Ditto.	Cir.-strati.	77	78	.90	Ditto.	Cir.-strati.	77	79	.87
27th	76	77	.88	S. E. do.	Strati.	79½	81½	.59	S. E. fresh.	Ditto.	79	87	.87
28th	76	77	.88	S. b. W. do.	Cum.-strati.	78	82	.93	S. b. W. lt.	Cumuli.	..	..	..
29th	75	77	.89	Ditto.	Cumuli.	77	80	.94	Ditto.	Ditto.	76	82	.93
30th	75	77	.91	N. b. E. do.	Cir.-strati.	77	80	.94	Ditto.	Ditto.	79	86	.92
31st	76	77½	.94	S. b. W. do.	Cum.-strati.	77	80	.95	Ditto.	Ditto.	79½	84½	.97
Total	1818.5	1854.5	448.67			1867.5	1985.0	477.80			1803.5	1965.5	448.86
Mean	75.770	77.270	29.9113			77.729	82.708	29.862			78.413	85.458	29.924

Instruments { Wet and dry bulb Thermometer by S. and B. Solomons, 39 Albemarle Street, London.  
Common Thermometer by Pirrala, 19 Hatton Garden, London.  
Aneroid Barometer 5117.  
Rain-gauge, copper tube with copper float and brass Index rod (patent) No. 87.





*Meteorological Observation kept at the Rangoon Field Hospital—(Continued.)*

3 P. M.				SUNSET.				9 P. M.				At Noon.	
Thermometer.		Baro- meter.	Force and direction of Wind.	Aspect of Sky.	Thermometer.		Baro- meter.	Force and direction of Wind.	Aspect of Sky.	Rain gauge over- set in night pro- bably 2 inches of rain lost, on the 11th.	Remarks.		
Wet.	Dry.				Wet.	Dry.							
79	95	..	S. E. fresh.	Hazy cum.	79	87	..	S. W. fresh.	Cumuli.				
75	95	..	S. do.	Cirri.	74	86	..	S. light.	Cirri.				
78	86	..	S. E. light.	Strati.	77	85	..	Ditto.	..				
77½	88	..	Ditto.	Cumuli.	77	85	..	S. E. light.	Cir.-strati.		2.44 Lightning.		
80	85	..	Ditto.	Strati.	77	79	..	Ditto.	Strati.		1.54 Ditto.		
79	83	..	S. fresh.	Ditto.	79	82	..	S. do.	Cum.-strati.		0.12 Thunder.		
79	81	..	N. W. light.	Rain.	77	78	..	S. W. fresh.	Strati.		0.85 Ditto.		
74	75	..	Ditto.	Cir -strati.	74	75	..	N. W. light.	Cir.-strati.		0.44		
80	88	29.96	S. do.	Strati.	76	78	29.95	S. W. do.	Strati.		0.74		
76	80	.96	S. W. do.	Ditto.	76	78	.96	S. do.	Ditto.		0.25		
76	78	.92	Ditto fresh.	Cir.-strati.	74	76	.93	..	Ditto.		0.0 Thunder		
75½	78	.96	Ditto light.	Cum.-strati.	76	78	.92	S. W. light.	C.-strati.		0.44		
75	77	.90	S. b. E. do.	Strati.	..	..	..	S. W. fresh.	Strati.		0.10		
77½	82½	.88	Ditto fresh.	Cum.-strati.	79	84	.88	N. W. light.	Ditto.		0.30 [Thunder.		
77	78½	.86	S. W. sqly.	Hazy (sqlys.)	77	81	.87	N. W. fresh.	Ditto.		No rain this 24hs.		
75	78	.88	Ditto.	Rain.	78	81	.90	W. N.	Ditto.		2.58		
79½	81½	.88	N. light	Cumuli.	74	75	.91	S. light.	Strati.		0.80 Thunder.		
80½	83	.86	N. W. do.	Ditto.	77	78	.87	..	Rain.		0.94		
77½	80	.84	S. do.	Ditto.	77	78½	.85	S. b. W. lt.	Cir.-cumuli.		1.10		
..	..	.85	Ditto.	Ditto.	77	78½	..	Ditto.	Cum.-strati.		0.22		
78	83	.85	S. W. fresh.	C.-strati.	77	80	.86	Ditto.	Cumuli.		0.52		
78	83½	.87	Ditto light.	Cumuli.	..	..	..	..	..		0.12		
79	87	.88	Ditto.	Cir.-strati.	76	78	.90	Ditto.	Rain.		[hours.		
79	87½	.93	Ditto.	Cum.-strati.	78½	81	.96	S. b. E. lt.	Cumuli.		No rain this 24		
1785.0	1913.5	478.28			1686.5	1762.0	388.76				0.72		
77.608	83.195	29.892			76.659	80.090	29.904				13.79		

J. FAYNER, M. D.

*Assistant Surgeon, Field Hospital, Rangoon.*





## NOTE.

The site of the accompanying observations is the Medical officer's (attached to the field Hospital,) quarters; they are in an open and exposed situation outside the great stockade, and not sheltered by surrounding jungle, that having been all cleared away by the Burmese before we took Rangoon.

The house is built of wood, raised on pile of teak 8 feet high, and the floor about that distance from the ground, which, in the immediate vicinity, is sandy and quickly absorbs the rain. It is about one mile due south of the Dagon Pagoda which, the Engineer officers inform me, is in Lat.  $16^{\circ} 47' 56''$  N. Long.  $96^{\circ} 13' 27''$  E. about one mile north of the river and raised above it about 40 feet.

*Remarks for the Month.*

The register was not commenced until the 8th, no instruments until that time being available.

The air during the first 8 days very dry; evaporation great; steady land and sea breezes, rendering the heat tolerable. In the evenings dense banks of cloud rising in the south with occasional lightning.

On the 10th a few drops of rain fell followed by a great fall of the temperature; squalls of wind with thunder during the night, but no rain.

On the 11th more rain fell at noon; cloudy with lightning at night; air not so dry and much cooler. Wind varying between S. E. S. W.; occasional heavy gusts of wind with rain and lightning; cloudy at night.

12. Rain fell heavily last night, commencing at about 10, accompanied by strong wind, thunder and lightning.

13. Warmer; a few showers with squalls of rain and wind with distant thunder.

14. Showers occasionally; wind prevailing from S. E. cool in with fresh breezes and thunder occasionally.

15. Wind in the morning S. E. with light showers; at about 3 p. m. wind changed suddenly with violent squalls of wind and rain to N. W.

16. Light showers; close; occasional squalls.

17. Ditto. 18. Showers occasionally, but very light, cool pleasant weather, but very close when the wind drops.

19. Ditto. 20. Heavy squalls of wind and rain from west.

21. Very cool and fresh, only one slight shower at sunset.





22. No rain ; cloudy with cool breeze before noon ; heavy rain after noon ; violent thunder storms with wind.

23, 24, 25, 26, 27. Much cold ; the former squally with shower of rain ; occasional thunder storms and variable winds.

28, 29, 30, 31. Much the same weather ; wind now steady.

*Hourly Observations commencing at Noon on the 21st May, 1852,  
for 24 hours.*

May. 21 Hours.	Thermometer.		Aneroid Barome- ter.	Force and direction of Wind.	Aspect of Sky.	Rain guage and Remarks.
	Wet.	Dry.				
Noon.	80	87	29.91	S. b. E. light.	Cumuli.	Rain guage 0.3 inches.
1 P.M.	78	88	.90	S. E. fresh.	Cumuli-strati.	
2	78	82	.89	S. E. do.	Ditto.	
3	77½	82½	.88	S. b. E. do.	Ditto.	
4	78½	83½	.87	S. do.	Ditto.	
5	78½	88	.88	S. W. light.	Cumuli.	Slight passing shower. 5 Minutes dura- tion.
6	79	82	.88	S. W. rain.	Cumuli-strati.	
7	76½	79	.88	S. W. light.	Cirro-cumuli.	
8	76	78½	.88	S. W. do.	Cirri.	
9	77	78½	.91	Calm.	Ditto.	
10	77	78½	.91	Ditto.	Ditto.	Calm and close. Ditto sultry. Ditto. Ditto.
11	76	78	.91	Ditto.	Ditto.	
12	76	77	.90	Ditto.	Ditto.	
1 A.M.	76	77	.89	S. W. b. light.	Ditto.	
2	76	77	.88	Ditto do.	Clear over head, Cirri on horizon.	
3	76	76½	.87	W. S. W. do.	Ditto.	Ditto all over day.
4	75½	76½	.88	S. W. do.	Ditto.	
5	75½	76½	.88	W. S. W. do.	Cirro-stratibe- gan from S. W.	
6	75	76½	.89	S. W. do.	Ditto	
7	76½	77½	.91	Ditto do.	Ditto.	
8	77	79½	.91	Ditto do.	Cumuli-strati.	No rain regis- tered in this 24 hours.
9	79	82	.92	Ditto do.	Ditto.	
10	79	85	.92	S. S. W. do.	Ditto.	
11	80	86	.91	Ditto do.	Ditto.	
12	80	87½	.90	S. b. W. fresh.	Cumuli.	
Total,	1933.5	20.0	747.36	4 hours from S. E. 1 do. from S. 4 do. from calm. 16 do. from S. W,		
Mean.	77.34	80.40	29.934			



## Abstract of Meteorological Observations for May, 1852.

Rangoon, June 1st, 1852.

Thermometer Sunrise.			Thermometer 9 A. M.			Thermometer Noon.			Thermometer 3 P. M.			Thermometer Sunset.			Thermometer 9 P. M.			Remarks.
Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	
Wetbulb.	78.73	75.31	80	75	77.97	81	71	73.41	80	74	77.58	79	74	76.64	83	73	76.04	Quantity of rain registered in pluviometer 11.79 inches, about 2 inches lost by oversetting of pluviometer on the 12th; prevailing winds in the latter part of the month S. and S. W.; in the early part unsteady, occasionally from the N. E. and N. W. Several heavy squalls of wind with rain, thunder and lightning at night. Since the first shower fell, the air has been much cooler.
Dry.	80.74	77.27	88	76	82.29	96	82	85.5	95	75	83.19	87	75	80.16	83	74	78.45	
Barometer. Sunrise.			Barometer 9 A. M.			Barometer Noon.			Barometer 3 P. M.			Barometer Sunset.			Barometer 9 P. M.			
Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	Maximum.	Minimum.	Min. of daily observation.	
29.96	28.88	29.91	30	29.89	29.94	30	29.87	29.92	29.96	29.84	29.89	29.96	29.85	29.90	30	29.88	29.93	

J. FAYRE, M. D.  
Assistant Surgeon, Field Hospital, Rangoon.

The Register of which this is an Abstract was commenced on the 8th May.



# Meteorological Register kept at the Field Hospital at Rangoon, for the Month of June, 1852.

SUNRISE.

9 A. M.

Noon.

	Thermometer.		Baro- meter.	Force and direction of Wind.	Aspect of Sky.	Thermometer.		Baro- meter.	Force and direction of Wind.	Aspect of Sky.	Thermometer.		Baro- meter.	Force and direction of Wind.	Aspect of Sky.
	Wet.	Dry.				Wet.	Dry.				Wet.	Dry.			
1st	78	79	29.97	S. b. W. lt.	Cirro-strati.	79½	83	30.	S. W. light.	Cumulo-strati.	79	89	30.	S. W. light.	Clo. strati.
2nd	77	78½	.97	Ditto.	Cirri.	80	83	30.	Ditto.	Ditto.	79	87	29.98	Ditto.	Cumuli.
3rd	76½	78	.98	Ditto.	Ditto.	79½	84	29.95	Ditto.	Cumuli.	80	90	.92	Ditto.	Ditto.
4th	77	78	.89	N. b. W. lt.	Cirro-strati.	79	81½	.93	Ditto.	Ditto.	80	88	.92	W. b. S. f.	Ditto.
5th	77	79	.93	S. W. light.	Ditto.	79½	84½	.94	Ditto.	Ditto.	80	88	.92	Ditto.	Ditto.
6th	77	79	.92	Ditto.	Cirro-cumuli.	80	86	.97	Ditto.	Ditto.	80	87½	.94	S. W. light.	Ditto.
7th	77	79	.92	Ditto.	Cirro-strati.	80	83	.94	Ditto.	Ditto.	75	81½	.92	W. light.	Rain.
8th	77½	78½	.91	Ditto.	Ditto.	79	81½	.95	Ditto.	Ditto.	78½	82	.93	S. W. fresh.	Ditto.
9th	75	76½	.92	Ditto.	Ditto.	79	81½	.95	Ditto.	Cumulo-strati.	79½	83	.93	S. W. light.	Clo. strati.
10th	77½	78½	.92	Ditto.	Ditto sultry.	80½	83	.94	N. E. light.	Ditto.	80	83	.93	S. E. ditto.	Cumuli.
11th	79	80	.93	Ditto.	Cumuli.	78½	71½	.94	S. light.	Ditto.	80	83	.94	Ditto.	Ditto.
12th	77	78½	.91	Ditto.	Cumulo-strati.	79½	82	.95	S. W. light.	Ditto.	77	82	.94	S. W. light.	Clo. strati.
13th	77	78	.93	Ditto.	Strati light rain.	78½	79½	.94	Ditto.	Strati.	80	84	.91	S. b. W. do.	Ditto.
14th	76	77½	.95	Ditto.	Cirro-strati.	78½	81½	.97	Ditto.	Cumuli.	79	82	.96	S. W. do.	Ditto.
15th	78	79	.93	Ditto.	Dense cl. hazy.	79	80½	.96	Ditto.	Cirro-strati.	80	84½	.92	S. E. do.	Ditto.
16th	78	79	.90	Ditto.	Cirro-strati.	77	79	.92	S. E. fresh.	St. rain & squally.	80	83	.92	S. light.	Cumuli.
17th	77	78	.91	S. E. light.	Ditto.	78	78½	.95	S. light.	Rain.	79	83	.93	S. W. ditto.	Ditto.
18th	78	79½	.93	Ditto.	Rain.	76	78	.96	S. W. light.	Ditto.	79½	83½	.94	Ditto.	Ditto.
19th	77½	79	.91	S. W. light.	Cumuli sultry.	80	83	.93	Ditto.	Cumuli.	80½	83	.91	S. W. fresh	Rain.
20th	77	78	.89	Ditto.	Ditto†	79	80½	.91	Ditto.	Ditto.	79	81	.92	S. W. light	Ditto.
21st	76	77	.88	Ditto.	Cirro-strati.	78	79½	.93	S. E. fresh	Cumulo-strati.	75½	77	.90	S. W. fresh.	Cirro-strati.
22nd	74½	75½	.94	Ditto.	Ditto.	77	79½	.93	S. W. light.	Ditto.	78	81½	.91	S. W. light.	Cumuli.
23rd	75	76	.94	Ditto.	Strati.	75	77	.95	Ditto.	Ditto.	77½	79½	.93	Ditto.	Ditto.
24th	*	*			....	77	78	.96	Ditto.	Ditto.	79½	83	.94	Ditto.	Ditto.
25th	74	75	.95	S. b. W. lt.	Cirro-strati.	77	79½	.95	S. b. W. lt.	Ditto.	78	82	.95	Ditto.	Ditto.
26th	76	77	.94	S. W. light.	Ditto.	77	78½	.95	Ditto.	Cumuli.	77	80½	.95	S. W. fresh	Ditto.
27th	76½	77	.95	S. b. W. lt.	Cirro-cumuli†	78	80½	.97	S. W. fresh.	Ditto.	79	82	.96	S. b. E. do.	Ditto.
28th	74½	75½	.98	N. E.	Calm-st. rain & thunder in night.	*	*			....	74½	76	.99	S. W. light.	Rain.
29th	75½	76½	.95	Ditto.	Ditto.	76	76½	30.02	Calm.	Cirro-strati.	78	80	.96	S. E. fresh.	Ditto.
30th	76½	77½	.97	Ditto.	Cumulo-strati.	78	79½	29.96	S. b. E. lt.	Cumuli.	80	83	.96	W. fresh.	Cumuli.
Total.	2222.5	2257.5	868.02			2271.0	2333.5	868.62			2362.0	2492.5	898.13		
Mean.	76.637	77.844	29.932			78.310	80.465	29.952			78.733	83.083	29.937		

\* No observation.

† Heavy rain during night.

‡ Light rain and thunder at night.



[illegible]

\* No observation.

J. FAYRE, M. D.





## NOTE.

The first ten days of the month have been fine, but little rain, and that in showers attended occasionally by squalls of wind with thunder. Weather close and sultry at times; the air damp, Thermometers indicating but little difference between the wet and dry bulbs.

The prevailing winds have been from the S. W. and the sky nearly always overcast with dense clouds.

During the middle and latter part of the month it has been much the same. The air damp, the sky cloudy, and the wind prevailing in the S. W. Frequent heavy squalls, at time accompanied by thunder and heavy shower, but of short duration.

The quantity of rain registered by the copper-tube rain-guage with a graduated (to tenths) brass index rod, is 16.43. The Barometer is placed in an open exposed situation and beyond the influence of trees, houses, walls, or other shelter. The Barometer is an Aneroid, No. 5117, which has been compared in Calcutta with the standard Barometer, but some are inclined to think its range now is rather too high. The Thermometers used are all by good makers, and several in number.

J. FAYRER, M. D.

*Assistant Surgeon, Field Hospital, Rangoon.*





*Hourly observations commencing at 6 A. M. on 21st June, 1852.  
Field Hospital Rangoon.*

June. 21.	Thermometer.		Aneroid Barome- ter.	Force and direction of wind.	Aspect of sky.	Rain guage.
	Wet.	Dry.				
6 A. M.	76	77	29.88	S. W. Lt.	Cirro-strati.	
7	76	77½	29.90	Ditto do.	Cumulo-strati.	
8	77½	79	29.92	Ditto do.	Ditto do.	Very light rain.
9	78	79½	29.93	S. E. fresh.	Ditto do.	Drops of rain.
10	77	78	29.92	S. do.	Ditto do.	
11	76½	78½	29.93	Ditto do.	Ditto do.	
12 Noon.	75½	77	29.90	S. W. do.	Ditto do.	Since yesterday at noon, 0.16 inches rain in guage.
1	76	77	29.90	S. W. Lt.	Strati—rain.	Light rain.
2	76½	78½	29.89	Ditto do.	Cumulo-strati.	Fair.
3	77½	80	29.87	Ditto do.	Cirro-strati.	Ditto.
4	77½	80½	29.86	Ditto do.	Strati.	Lt. rain.
5	76½	78½	29.86	Ditto do.	Cumuli.	Fair.
6	76	78	29.87	Ditto do.	Cirro-cumuli.	Ditto.
7	76	78	29.89	Ditto do.	Ditto do.	Ditto.
8	76	78	29.89	Ditto do.	Ditto do.	Ditto.
9	76	78	29.90	Ditto do.	Ditto do.	Ditto.
10	77	78	29.90	Ditto do.	Ditto do.	Ditto.
11	77	79	29.91	Ditto do.	Clear.	Ditto few cirri on horizon.
12	77½	79	29.91	Ditto do.	Cumulo-strati.	Few drops of rain falling.
1	75	78½	29.88	S. F.	Strati.	Heavy shower.
2	75½	76	29.87	S. W. Lt.	Ditto.	Gentle light rain.
3	75½	76	29.87	Ditto do.	Cumulo-strati.	Ditto.
4	75	76	29.87	Ditto do.	Strati—rain.	Ditto.
5	75	76	29.88	S. E. do.	Cumulo-strati.	Since noon of yes- terday in guage 0.6 inches of rain.
6 A. M. 22nd	75	76	29.89	S. do.	Ditto—rain.	
Total,	1907.0	1947.5	747.29			
Mean,	76.28	77.9	29.8916			

J. FAYRER, M. D.  
*Field Hospital.*





1852.]

*Meteorological Observations kept at Rangoon.*

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*Abstract of Meteorological Observations for June, 1852.**Rangoon, July 1st, 1852.*

Thermometer Sunrise.			Thermometer 9 A. M.			Thermometer Noon.			Thermometer 3 P. M.			Thermometer Sunset.			Thermometer 9 P. M.			Remarks.
Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	
Wet bulb.	79.5	76.758	80.75	78.413	79.08	80.74.5	78.666	79.08	74.5	77.915	79.08	81.73.5	77.263	79.08	74.0	76.860	79.08	Quantity of rain up to Sunrise of July 1st 16.43. Prevailing winds S. W. First ten days of month fine, rain in showers, occasional squalls with thunder. Weather close and sultry at times, and the air damp. Sky cloudy. During the middle and latter parts of the month, sky cloudy and temperature cool; air damp; wind prevailing from S. W.; latterly very squally in the afternoon, and nights, attended by thunder, violent gusts of wind and heavy showers of rain, though of short duration.
Dry.	80.5	77.839	84.76.5	81.189	83.02	90.76	83.02	90.5	76	82.277	86.5	74	80.052	83	75	78.560	83	
Barometer Sunrise.			Barometer 9 A. M.			Barometer Noon.			Barometer 3 P. M.			Barometer Sunset.			Barometer 9 P. M.			
Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	Maximum.	Minimum.	Mean of daily observation.	
29.98	29.88	29.932	30.02	29.91	29.952	29.91	29.937	29.98	29.87	29.907	29.96	29.88	29.901	29.98	29.80	29.951	29.951	

J. FAYRE, M. D.  
*Assistant Surgeon, Field Hospital, Rangoon.*



# Meteorological Register kept at the Field Hospital at Rangoon, for the Month of July, 1852.



July.	AT SUNRISE.					AT 9 A. M.					AT NOON.				
	Thermometer.		Force and direction of Wind.	Aspect of Sky.	Baromet. Height.	Thermometer.	Force and direction of Wind.	Aspect of Sky.	Baromet. Height.	Thermometer.	Force and direction of Wind.	Aspect of Sky.	Baromet. Height.	Thermometer.	Aspect of Sky.
	Wet Bulb.	Dry Bulb.				Wet Bulb.				Wet Bulb.				Wet Bulb.	
1	75	75.5	N. E. light.	Cirro-strati.	29.95	77	N. E. lt.	Cirri.	29.96	80	N. E. lt.	Cirri.	29.97	77.5	S. W. light.
2	74	75.5	S. W. do.	Cirro-cumuli.	.95	76	S. W. do.	Cirro-cumuli.	.96	77.5	S. W. do.	Cirro-cumuli.	.95	83.5	Cumuli.
3	74.5	75	Ditto.	Ditto.	.96	76.5	Ditto fresh.	Cumuli.	.97	78.5	Ditto fresh.	Cumuli.	.95	81	Ditto.
4	74.5	75.5	Ditto.	Cumuli.	.94	78	Ditto light.	Ditto.	.95	80.5	Ditto light.	Ditto.	.95	80	Rain.
5	74.5	75.5	Ditto.	Cumulo-strati.	.94	77	Ditto.	Cirro-strati.	.91	79	Ditto.	Cirro-strati.	.92	79.5	Cum.-strati.
6	75	75.5	Do. fresh.	Ditto.	.88	77	Do. fresh.	....	.91	79	Do. fresh.	....	.85	79	Strati.
7	77	77.5	Do. light.	Cumuli.	.84	78	Do. light.	Cumuli.	.86	80.5	Do. light.	Cumuli.	.83	80	Cumuli.
8	75	75.5	Ditto.	Strati rain.	.83	77	Ditto.	Cirro-strati.	.87	77	Ditto.	Cirro-strati.	.86	79	Strati.
9	74	74	Ditto.	Cumuli.	.89	75	Ditto.	Ditto.	.93	76	S. E. light.	Ditto.	.90	82.5	Cumuli.
10	74.5	75.5	S. E. do.	Ditto.	.87	78	S. E. do.	Cumulo-strati.	.95	78.5	Ditto.	Cumulo-strati.	.94	85.5	Ditto strati.
11	79	79.5	N. do.	Hazy.	.97	79.5	N. do.	Cumuli.	.99	80	S. W. do.	Cumuli.	.96	84	Cumuli.
12	78	79	S. E. do.	Ditto.	.96	79	S. E. do.	Ditto.	.97	80	Ditto.	Ditto.	.95	86	Ditto.
13	78	79.5	S. W. do.	Cumuli.	.95	79.5	S. W. do.	Ditto.	.99	81.5	Ditto.	Ditto.	..	..	..
14	78.5	79.5	S. E. do.	Ditto.	.98	77	Ditto.	Ditto showers.	30.	79	Ditto.	Ditto showers.	..	..	..
15	75	76.5	S. E. do.	Cumulo-strati.	.96	75	S. b. E. do.	Cirro-strati.	30.	78	S. b. E. do.	Cirro-strati.	.97	85	Cumuli.
16	75	76	S. E. do.	Cumuli.	.97	75	Ditto.	Cumuli.	30.	79.5	Ditto.	Cumuli.	.96	81.5	Ditto.
17	77.5	78	S. W. do.	Cumulo-strati.	.96	79	S. W. lt.	Ditto.	29.97	80.5	S. W. lt.	Ditto.	.97	87.5	Ditto.
18	78	79	S. do.	Cumuli.	.95	79	N. W. do.	Ditto.	.98	81	N. W. do.	Ditto.	.99	87	Ditto.
19	76	79.5	S. W. do.	Hazy.	.96	79	S. W. do.	Ditto.	.97	82.5	S. W. do.	Ditto.	.99	88.5	Ditto.
20	79	81	W. do.	Cumuli.	.96	79.5	S. do.	Ditto.	30.01	84.5	S. do.	Ditto.	.97	87.5	Ditto.
21	79	80.5	Calm.	Hazy.	.97	77	S. b. W. f.	Cirro-strati.	30.	80.5	S. b. W. f.	Cirro-strati.	.97	77	Rain.
22	75	75	S. W. light.	Rain.	.96	77	S. W. light.	....	30.	80.5	..	....	30.04	81	Cumuli.
23	*	76	..	Cumulo-strati.	30.	77	N. W. light.	Cumulo-strati.	30.03	80.5	N. E. lt.	Cumuli.	30.	83	Ditto.
24	75	79	N. W. light.	Ditto.	29.99	77	W. b. N. do.	Ditto.	30.	79	..	Ditto.	..	..	[showers.
25	77.5	79	Ditto.	Cirro-strati.	.96	78.5	Ditto.	Ditto.	29.96	81	S. W. light.	Cirro-strati	.93	79	Cirro-strati
26	76	79	W. b. S.	Strati rain.	.93	75.5	S. W. light.	Strati rain.	.95	76	S. W. do.	Rain.	.92	76	Rain.
27	75	76	..	....	..	78	Ditto.	Cirro-strati.	.96	80	Ditto.	Strati.	.90	79	Strati.
28	*	76	S. b. E.	Cumulo-strati.	.96	77	S. b. E.	Ditto.	.99	79	Ditto.	Ditto.	.96	78	Rain.
29	75	75	S. W.	Ditto.	.94	76.5	S. W.	Cumuli.	.96	78	Ditto.	Cumuli.	.93	83	Cumuli.
30	74.5	75	..	....	..	75	..	Ditto.	.97	76.5	Ditto.	Ditto.	.96	80.5	Ditto.
31	*	75	..	....	..	75	..	Ditto.	.97	77	Ditto.	Ditto.	..	..	..
Total.	2129.0	2159.0			838.38	2398.5	N. S. b. W.		869.09	2469.5	N. S. b. W.		808.49	2211.0	Rain.
Mean.	76.035	77.107			29.942	77.370	S. W.		29.968	79.661	S. W.		29.944	80.188	Hazy.

\* No observation.



*Meteorological Register kept at the Field Hospital at Rangoon—(Continued.)*

AT 3 P. M.										AT SUNSET.										AT 9 P. M.										Remarks.	Rain Gauge.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Thermometer.		Anemometer.	Force and direction of Wind.	Aspect of Sky.	Thermometer.		Anemometer.	Force and direction of Wind.	Aspect of Sky.	Thermometer.		Anemometer.	Force and direction of Wind.	Aspect of Sky.	Thermometer.	Anemometer.	Force and direction of Wind.	Aspect of Sky.	Rain Gauge.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Wet Bulb.	Dry Bulb.				Wet Bulb.	Dry Bulb.				Wet Bulb.	Dry Bulb.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
78	81	29.92	S. W. lt.	Cumuli.	75	77	29.94	S. W. lt.	Cir.-cumuli.	75.5	77	29.96	S. W. lt.	Cir.-cumuli	1.14	Heavy rain during night with thun-der.	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</

\* No observation.





## NOTE.

The weather during the early part of this month has been for the most part fine, especially during the day time. The prevailing winds have been S. W. with occasional heavy squalls accompanied by rain.

The atmosphere cool and damp, evaporation very slight—the quantity of rain fallen up to the 15th a little more than 11 inches, the heaviest falls on the 9th 10th, and 12th.

The latter part of the month rather wetter; wind prevailing from S. W. shifting occasionally to the N. and N. E. The rain has fallen more during the day time than in the early part of the month.

The maximum temperature at any time has been 89° Farht. but generally very much lower; the rain has for the most part fallen in showers.

J. FAYRER.





*Hourly Observations commencing at sunrise on the 21st of July, for  
24 hours.*

July.	Thermometer.		Aneroid Barome- ter.	Force and direction of wind.	Aspect of sky.	Rain guage.	Remarks.
21.	Wet.	Dry.					
Sun- rise.	79.	80.5	29.97	Calm.	Cumulo-strati.	.48	Close & sultry.
7	79.	81.	.98	S. W. light.	Cumuli.	in guage at sun- rise fell yester- day.	
8	79.5	82.	.99	Ditto do.	Ditto		
9	77.	80.5	30.	Ditto fresh.	Cumulo-strati.		Gentle shower, just finished.
10	79.	83.	29.98	Ditto do.	Scattered cum. strati.		Air clear.
11	77.	81.5	.97	Ditto light.	Cumuli.		
Noon.	79.5	81.5	.97	Ditto do.	Ditto.		Sky overcast with dense Cumuli.
1	77.5	82.	.97	Ditto do.	Ditto.		
2	77.5	82.5	.96	Ditto do.	Ditto.		
3	79.	83.5	.96	Do. freshing	Ditto.		
4	79.	84.	.94	South do.	Strati.		Sky dark and threatening.
5	78.	81.	.95	S. by E. lt.	Cumulo-strati.		
6	79.5	80.5	.96	Ditto do.	Ditto.		
7	78.5	80.5	.98	S. by W. do.	Cumuli.		Sky less over- caste
8	78.5	80.5	.99	S. by E. do.	Ditto.		Hazy about horizon and no rain.
9	78.5	80.5	30.	S. by W. do.	Cirro-cumuli.		Ditto.
10	78.5	80.5	30.01	South lt.	Ditto.		Ditto.
11	77.	80.	.01	Ditto do.	Ditto.		Ditto.
12	78.	80.	.00	S. by W. do.	Ditto.		Ditto.
1	77.	79.	29.98	S. W. do.	Ditto.		Ditto.
2	77.	79.	.96	Ditto do.	Cumuli.		Hazy, clearing off.
3	77.5	79.	.95	Ditto do.	Ditto.		Ditto.
4	74.5	75.5	.97	Ditto squall with a light shower.	Ditto.		Raining gent- ly.
5	75.5	75.	.96	Ditto lt.	Strati & rain.		Ditto.
6 A.M.	75.	75.	.96	Ditto do.	Ditto.	.64	Ditto.
Total.	1946.0	2008.0	749.37			0.64	
Mean.	77.84	80.32	29.9748				J. FAYRER.





## Abstract of Meteorological Observations for July, 1852.

Rangoon, August 1st, 1852.

Thermometer Sunrise.			Thermometer 9 A. M.			Thermometer Noon.			Thermometer 3 P. M.			Thermometer Sunset.			Thermometer 9 P. M.			Remarks.
Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	
84.5	79.5	75	84.5	79.5	77.25	88.5	81.5	75.5	83	74.5	78.75	81.5	79.5	73.5	79	74	76.50	Quantity of rain during the whole month 21.35 inches. The weather during the early part of the month, fine, especially during the day time. Wind generally from S. W. with occasional squalls and showers. Air cool, but very damp. On several days so little rain fell as not to be appreciable in the gauge. The heaviest falls were on the 9th, 10th and 12th. The latter part of the month wetter; prevailing winds still S. W. but shifting occasionally to N. and N. E. Rain has fallen more during the day time than in the early part of the month.
78	76.5	70	78	76.5	70	83	77.5	78.5	89	75.5	82.25	75	78.25	78.5	82	75	78.5	
Barometer Sunrise.			Barometer 9 A. M.			Barometer Noon.			Barometer 3 P. M.			Barometer Sunset.			Barometer 9 P. M.			
Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	Maximum.	Minimum.	Min. of preceding observation.	
30	29.83	29.915	30.03	29.86	29.940	30	29.83	29.915	29.98	29.82	29.90	29.98	29.84	29.91	30.02	29.84	29.93	

J. FAYRE, M. D.  
Assistant Surgeon, Field Hospital, Rangoon.



*Literary Intelligence.*

In Bombay the following works have been lithographed :

A new edition of the *Rawdhat as-Safá* in one volume folio and much clearer than the edition in two volumes which was published in 1261.

Dywáne *Háfítz*, 8vo. 439 pp. A. H. 1267. This is the third or fourth edition published at Bombay and the text differs both from the Bombay 4to. edition of 1244, and from the Calcutta 4to. edition. It is very elegantly written but not very correct.

The *Khamsah* of Nitzámy small folio, 1265. This edition is not correct. It comprises the *Iqbál-námah* Iskandary which is also called the *Sekandar-námah* Barry but not the *Khirad-námah* which is also called the *Iskandar-námah* Bahry and which in fact is rarely met with. The latter is being published in the *Bibliotheca Indica*, the first half is out and the second half is in progress. The *Khamsah* has also been lithographed at Teherán.

A new edition of the complete works of Sa'dy in 4to. It is superior to the folio edition of 1296, but much inferior to Mr. Harington's edition. Another edition has been lately made at Dilly.

Of the *Mathnawý* of Jalál aldyn Rumiý two new editions have been made both in 8vo. one is written in *Naskhta'lyq* 1267 and the other in *Naskhy*. The former is said to be more correct.

*Hamlahe Haydary* or the history of Mohammad in verses by Mumin 'ally Kirmány. The author was a converted Parsee and died a few years ago, folio near 600 pp. A. H. 1264.

At Lucnow the *Hamlahe Haydary* of Bádzil (who died in A. H. 1123) has been lithographed, it is a rhymed version of the *Ma'árij alnobúwat*, in about 40,000 verses. Folio 238 & 333 pp. A. H. 1267.

The first No. of the *Journal Asiatique de Constantinople* has been received from the Editor, M. Cayel, whose introduction draws attention to the many gaps in early Turkish History and to the materials available in Turkey for filling them up. Much information is doubtless to be obtained from the *Medjmoua*, and *Memoranda* which he describes as abounding in the Turkish Libraries and which it is impossible that M. de Hammer can have exhausted. This No. promises well and if, as he hints in a short preliminary notice on the contribution of an Armenian gentleman, the Editor should undertake to publish translations of old Armenian MSS. his *Journal* may be expected to furnish Orientalists with much useful material.





PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR JUNE, 1852.

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The usual monthly meeting of the Society was held on Wednesday the 2d instant, at half-past 8 P. M.

SIR JAMES COLVILE, President, in the chair.

The proceedings of the last month were read and confirmed.

Read a letter from Captain Layard, forwarding, for presentation to the Society, a copper coin found at Gour, and another of the Dutch East India Company, dated 1790, brought from Coipang in the island of Timor.

Lieut. Burgess, duly proposed and seconded at the last meeting, was balloted for, and elected an ordinary member.

The following gentlemen were named for ballot at the next meeting.

C. Allan, Esq. C. S. ;—proposed by Sir James Colvile and seconded by Mr. J. R. Colvin.

J. J. Ward, Esq. C. S. ;—proposed by Mr. Grote and seconded by Sir James Colvile.

Read a report from the Council, recommending that Bábu Rájendra-lál Mittra having offered to edit the Prakrit Grammar of Kramadis'wara, the Chaitanya Chandrodaya Náataka, and the Aniruddha Champu, for publication in the Bibliotheca Indica, his offer be accepted.

Resolved that the recommendation of the Council be adopted.

Communications were received—

1st. From C. Allan, Esq. Officiating Secretary to the Government of India, forwarding a report, by Commander Felix Jones, on the state of the tribes bordering on the River Tigris.



Referred to the Journal Committee.

2d. From Dr. Baddeley, submitting through Mr. Piddington, a paper entitled "Notes on Whirlwinds."

Ordered to be printed in the Journal.

3d. From Dr. A. Campbell, enclosing a paper entitled "Diary of a Journey through Sikim to the Frontiers of Thibet."

Ordered for publication in the Journal.

4th. From Lieut. F. J. Burgess, through Captain Thuillier, stating that the earthquake in Pillibheet of which he had previously communicated a short account commenced at Victoria Gunge exactly at 8° 7' 54" P. M. and ceased at 8° 29' 24" P. M.

Mr. Colvin drew the attention of the meeting to Mr. Bayley's offer to forward a notice of the figure of Jupiter which was lately exhibited to the Society, and recommended that the Secretaries be requested to communicate with him on the subject.

Rev. J. Long enquired if it was the intention of the Society to make any use of the MS. History of Tipperah which Dr. Wise had sent to it some time ago. He made the enquiry, he said, by desire of Dr. W. who wishes the MS. to be returned to him in the event of the Society's not printing it in the Bibliotheca Indica.

This led to some conversation as to the merit of the work; when it was resolved that the MS. be referred to the Philological Committee to consider whether the philological character of the work was such as to render desirable the publication of the whole or any part of it in the Bibliotheca Indica, or the retention of a copy of it for the Library.

The Librarian having submitted his usual monthly report the meeting adjourned.

Read and confirmed,

7th July, 1852.

(Signed) J. R. COLVIN.

*Report of the Curator Museum Economic Geology.*

*Geology and Mineralogy.*—Major Jenkins has sent us from Assam some specimens of a tufaceous Limestone from the Naga Hills in the neighbourhood of Jaipore, where it was laid open by a landslip. Major Jenkins observes that this locality was hitherto supposed to be devoid of any limestone, and that thus the discovery may be one of some local importance. The limestone itself has nothing worthy of note about it.





Mr. J. W. Biss has presented a few miscellaneous fossil specimens and minerals, mostly from the neighbourhood of Bristol, from which we shall be able to select a few for our collections.

*Economic Geology.*—Captain Sherwill has forwarded to the Museum, from Kursiong near Darjeeling, a quantity of common scaly Graphite of two different varieties, black and grey, of which he says :

“ The bed or rather rocks bearing the mineral are 2600 feet thick ! This has been principally brought to light by a landslip that I went to examine ; No. 2 specimen is from the landslip.”

As before said, this is unfortunately only an inferior description of graphite, of which, though in such abundance, the sale would not probably pay the costs of carriage and freight, but I have pointed out to Captain Sherwill the chances that a more compact kind may be found amongst or near to this, and the compact kind, as well known, is highly valuable for its use in the fine arts.

Mr. Berdsmore of Mergui has forwarded a box of ores and slag which he supposed to be Copper, but the whole of them are Iron. A fine specimen of tin ore accompanies them.

I have obtained for the Museum a specimen of American machine-made bricks, which are brought from that country to California, and here as ballast, as I am informed ; and being sold here are found very useful from their stone-like hardness for the flooring of stables, and work of that description.

#### LIBRARY.

The following additions have been made to the Library during the month of May last.

#### *Presented.*

Sindh, and the Races that inhabit the valley of the Indus. By Lieut. R. F. Burton. London, 1851. 8vo.—PRESENTED BY THE AUTHOR.

Symbolical Euclid in Urdu, edited by William Lawler, Anglo-Arabic Master of the Madrasah College. Calcutta, 1852. 8vo. Lithograph.—BY THE EDITOR.

Proceedings of the Agri-Horticultural Society of the Punjab, from 1st May to 31st December, 1851. Lahore, 1852. 8vo.—BY THE SOCIETY.

The Oriental Christian Spectator for April, 1852.—BY THE EDITOR.

Journal of the Indian Archipelago for February, 1852, (two copies). —BY THE GOVERNMENT OF BENGAL.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of April, 1852.—BY THE DEPUTY SURVEYOR GENERAL.





The Calcutta Christian Observer for June, 1852.—BY THE EDITORS.

The Oriental Baptist for June, 1852.—BY THE EDITOR.

The Upadeshak for June, 1852.—BY THE SAME.

Is Bible the Book of All, or is it but the Book of the Few? A reply to Dr. Cahill's tract, distributed by Roman Catholics at the doors of St. John's and other Protestant places of worship. Svo. Pamphlet.—BY THE AUTHOR.

Bibidáhrtha Saṅgraha, No. 6.—BY THE EDITOR.

The Tattwabodhiní Patriká, No. 106.—BY THE TATTWABODHINÍ SABHA'.

Citizen Newspaper for May, 1852.—BY THE EDITOR.

*Purchased.*

Annals and Magazine of Natural History for March, 1852.

Journal des Savants for January, February and March, 1852.

Comptes Rendus, Nos. 5 to 13.

Edinburgh Review, No. 193.

RA'JENDRAL'AL MITTRA.

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FOR JULY, 1852.

At a meeting of the Asiatic Society held on the evening of the 7th of July, 1852.

J. R. COLVIN, Esq., Senior Member of the Council present, in the chair.

Bábu I'swarachandra Ghosál was introduced as a visitor by Bábu Ramgopaul Ghose.

The proceedings of the preceding meeting were read and confirmed.

The following presents were received.

1st. From C. E. Blechynden, Esq. Ghotal, a Hindu image found at Purnah, a village situated in Purgunnah Burdah, Zillah Hooghly.

2nd. From Dr. Fayrer, Rangoon, through Messrs. Henley and Co. 5 stone and 2 wooden images of Buddha.

3 wooden images of Buddhist Devotees.

1 Ditto of a monster.

A Burmese short sword.

Four pieces of Burmese painted glass.

A wooden instrument for keeping poison (?)

3rd. From J. W. Dalrymple, Esq. Under-Secretary to the Government of Bengal. A map of the province of Orissa, for the Museum of Economic Geology.



From Captain Thuillier, Deputy Surveyor General, forwarding a Map of Orissa for the Society's Library.

From Dr. N. Wallich, through Messrs. Cantor and Co., his translation of Professor Eschricht's Memoir on the Gangetic Dolphin.

Messrs. C. Allen, and J. J. Ward of the Civil Service, duly proposed and seconded at the last meeting, were balloted for, and elected ordinary members.

Bábu Ramánáth Bannerjea was named for ballot at the next meeting ;—proposed by J. R. Colvin, Esq. and seconded by A. Grote, Esq.

Read a Report from the Council stating that at the recommendation of the Library Committee they have resolved on the publication of a Catalogue of the Library, the cost of such a work being estimated at about Rs. 360 ; and that they have further placed Rs. 500 at the Committee's disposal for the purchase of books.

A Meteorological Register kept at Rangoon, during the month of May last, by Dr. Fayrer, communicated through Mr. Blyth, was laid on the table.

Ordered on a suggestion from Captain Thuillier that a copy of the Meteorological Register be placed at the disposal of the Editors of the daily papers of Calcutta for publication.

Read a letter from Mr. Beadon forwarding on behalf of Mr. Beaufort a collection of coins (22 specimens) found in Jessore near Mehamedpur, together with a report on the same by Bábu Rájendralál Mittra.

Resolved that Mr. Beaufort be thanked for the collection, and that he be at the same time requested to favour the Society with further particulars as to the finding of the coins.

The Curators and the Librarian submitted their usual monthly reports, and thanks having been voted for the above communications and presents, the meeting adjourned.

(Signed) J. W. COLVILLE.

#### LIBRARY.

The undermentioned works have been added to the Library since the last meeting.

#### *Presented.*

Supplementum annotationis in librum as Sujutii de nominibus relativis, inscriptum لب اللباب continens novorum codicum collationem et exerpta





ex as-Sámání libro الانساب فى et ibno 'l-Athiri libro اللباب. Scripsit P. J. Veth. Lug. Bat. 1851, 4to.—PRESENTED BY THE CURATORS OF THE ACADEMY OF LEYDEN.

Specimen e literis Orientalibus exhibens librum Geneseos, secundum Arabicam Penteutachi Samaritani versionem ab Abu Saido conscriptam. Edit A. Kuenen, Lug. Bat. 1851, 8vo.—BY THE SAME.

Journal of the Academy of Natural Sciences of Philadelphia, 1st series, Vol. VI. Part I. and New Series Vol. II. Part II.—BY THE ACADEMY.

A Memoir of Samuel George Morton, M. D. By Charles D'Meigs, M. D. Philadelphia, 1851, 8vo. Pamphlet.—BY THE SAME.

Conversations about Hurricanes; for the use of Plain Sailors. By Henry Piddington, Esq. London 1852, 8vo.—BY THE AUTHOR.

Bulletin de la Société de Géographie, 4th series, Vol. I.—BY THE SOCIETY.

Observations made at the Magnetical and Meteorological Observations at Hobarton, Van Dieman's Island, Vol. II. London 1852.—BY DIRECTION OF THE BRITISH GOVERNMENT.

Über die Sprache der Jakuten. Grammatik, Text und Wörterbuch. Von Otto Böhtlingk. St. Petersburg, 1851, 4to.—BY THE AUTHOR.

Vendidad capita quinque priora. Emendavit Christianus Lassen, Bonnæ, 1852, 8vo. 2 parts.—BY THE AUTHOR.

The Journal of the Royal Geographical Society of London, Vol. XXI. BY THE SOCIETY.

On the Geology of Part of the Himálayan Mountains and Tibet. By Capt. R. Strachey. Pamphlet.—BY THE AUTHOR.

On the Physical Geography of the Provinces of Kumaon and Gurhwal. By R. Strachey. Pamphlet.—BY THE AUTHOR.

Zeitschrift der Deutschen Morgenländischen Gesellschaft. Fünfter Band IV. Heft.—BY THE GERMAN ORIENTAL SOCIETY.

Report of the Revenue Administration of the Lower Provinces for the official year 1850-51. Calcutta 1852, foolscap folio.—BY THE GOVERNMENT OF BENGAL.

Journal of the Indian Archipelago, for March and April 1852. Two copies each.—BY THE SAME.

Selections from the Records of the Bengal Government No. VI.—BY THE SAME.

On the Gangetic Dolphin. By Don. Fred. Eschricht. Translated from the Danish by Dr. N. Wallich, 8vo. Pamphlet.—BY THE TRANSLATOR.

An Essay on Bengali Poetry in Bengali, by Rangalála Bannerjya, 12mo.—BY THE AUTHOR.

Journal Asiatique No. 85.—BY THE ASIATIC SOCIETY OF PARIS.





Oriental Christian Spectator for May and June 1852.—BY THE EDITOR.

The Missionary for June and July 1852.—BY THE EDITOR.

The Tattwabodhini Patrikā, No. 107.—BY THE TATTWABODHINI' SABHĀ'.

Annual Report of the Tattwabodhini Sabhā, 8vo. Pamphlet.—BY THE SAME.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of May, 1852.—BY THE DEPUTY SURVEYOR GENERAL.

The Oriental Baptist for July, 1852.—BY THE EDITOR.

The Calcutta Christian Observer for July 1852.—BY THE EDITORS.

The Upadeshak for July, 1852.—BY THE EDITOR.

The Benares Magazine for April, 1852.—BY THE EDITOR.

The Citizen for June 1852.—BY THE EDITOR.

The Purnachandrodaya for June, 1852.—BY THE EDITOR.

Wind and Current Charts, by Capt. Maury.—BY THE AUTHOR.

*Exchanged.*

The Calcutta Review, No. 33.

The Athenæum for November, 1851.

The London, Edinburgh and Dublin Philosophical Magazine, Nos. 13, 14, 15.

*Purchased.*

The Edinburgh Review, No. 194.

The Annals and Magazine of Natural History, for May, 1852.

RA'JENDRALĀ'L MITTRA

FOR AUGUST, 1852.

The Society met on the evening of the 4th instant, at half-past 8 P. M.

Sir JAMES COLVILE, Kt., President, in the chair.

The following visitors were present at the meeting :—Mr. Montresor on the introduction of Mr. Welby Jackson, Mr. Sterndale on ditto of Captain Thuillier, and Colonel Bersenczey on ditto of Dr. Sprenger.

The proceedings of the last meeting were read and confirmed.

The following presentations to the Library and to the Museum of Antiquities were announced.

1st. From C. Murehead, Esq., Principal of the Grant Medical College, Bombay. Annual Report of the College for the Session 1851-52, and a copy of Dr. Cole's Introductory Lecture.





2nd. From Professor Fleischer on behalf of the German Oriental Society. The Journal of that Society, Vol. VI. part I.

3rd. From Major Troyer. His French translation of the Rāj-tārangini, Vol. III.

From E. E. Salisbury, Esq., Secretary to the American Oriental Society, Vol. II. of the Journal of that Society. With reference to Mr. Salisbury's offer to establish an exchange of publications, *Resolved*, that a set of the Researches, and of the Journal as far as available, be presented to the American Oriental Society, and that future Nos. of the Journal be sent to it as published.

From Mr. J. T. Bodel Nyenhuis, Secretary to the Netherland's Society of Literature. A catalogue of the Society's Library.

From Herr Schröter, Secretary General of the Imperial Academy of Sciences of Vienna, a set of the Academy's publications as follows:

Proceedings of the Historical and Mathematical classes for the years 1849-50-51.

Transactions of ditto ditto for the same period.

Fontes Rerum Austriacarum, Vol. III.

Simony Alterthumer, Vol. I.

Referring to the Academy's wish to establish an exchange of its publications, *Resolved*, that a set of the Researches and of the Journal as far as available be presented to the Imperial Academy of Sciences of Vienna, and that future Nos. of the Journal be sent to it as published.

From Baron Von Hammer Purgstall—The Vienna Review for 1851, 4 Vols., and the first two Vols. of his History of Arabic Literature.

The following is an extract from the Baron's letter:—

"I take the liberty of presenting by your channel to the Honorable Asiatic Society of Calcutta, the first two Volumes of my history of Arabic Literature. This Asiatic Society having taken the lead of all those which have since followed its example, has also the first claim to the gratefulness of all Orientalists, and leads therefore the van in the dedication of the seven Asiatic Societies to which I have dedicated my work as a token of respect and thanks for the honor conferred upon me as their member."

*Resolved*—That the Society express to Baron Purgstall its cordial acknowledgments of the compliment paid to it in his dedication.



From Captain Layard, in the names of himself and Mr. J. J. Grey, of Goamutty, Malda; the following sculptures found in the north-western suburb of ancient Gour, now called Gungarampore.

1st. A reclining Female Figure with an Infant (from Mr. Grey).

2nd. An Image of the god Surya.

3rd. Two stones with carving, apparently parts of an entablature over a door-lintel.

From Mr. C. Rafn, Secretary to the Royal Society of Northern Antiquities—The latest publications of the Society.

The subjoined is an extract from Mr. Rafn's letter.

“ Application has been made to our Society several times, as well from Great Britain, especially from Scotland, as also separately from Ireland, to publish an edition of the most important records contained in our ancient MSS. relative to the British Isles. The Archæological journeys lately undertaken by two of our Society's Fellows, Professor P. A. Munch, a Norwegian, and Mr. Worsaae, a Dane, have awakened an increased degree of interest for a project of this nature, and the time seems now to have arrived for proceeding to its realization. A new critical edition of the important Saga relating to the inhabitants of the Orkneys is the first object which we have in view, but that the plan may be carried out in a suitable manner, it is of importance to create an interest for the same in the British Isles, for whose historical and Archæological inquirers, this work would be principally designed. This matter we beg earnestly to recommend to the Council of your Society, and such of its fellows as may take an interest therein.”

The thanks of the Society were recorded for the above presentations.

Babu Rammanath Bannerjea, duly proposed and seconded at the last meeting, was balloted for and elected an ordinary member.

Captain W. J. Nicolls, 24th Regiment, Madras N. I., was named for ballot at the next meeting;—proposed by Mr. Grote, and seconded by the President.

Communications were received.

1st. From Captain Layard, sending his drawings of the Gour ruins, and of their architectural details for the inspection of the Society, and explaining his reason for sending them to England.

The following is an extract from Captain Layard's letter.

“ Captain Thuillier will make over to you a short MS. and two books



of rough drawings made at Gour during my short stay there in January last. My intention is to send them to England to my brother to allow him to judge whether they are of sufficient interest for publication. However as I obtained permission from Government through the kind intercession of the Asiatic Society to visit the ruins, it is only just that I should show the Society that their kindness has not been abused, and that all such objects as I considered of interest from their antiquity have been transferred, though I fear very inadequately, to my sketch-book and MS.

“I should say that my notes were intended for publication (if approved of) in the Asiatic Society’s Journal, but as they would be of little worth without the drawings, and the execution of these in presentable form, being rather problematical in India, it is perhaps best to forward all to England.”

2nd. From Major M. Kittoe, enclosing a note on the ancient gold coins from near Benares, which were with the permission of Government exhibited at the general meeting of April last, together with copy of a note on the same, by Mr. E. C. Bayley.

Ordered for publication in the Journal with the Catalogue which previously accompanied the coins, and with the fac-similes which have been taken of such of them as are worthy of note.

3rd. From Dr. Fayrer, Field Hospital, Rangoon—Meteorological Register kept at Rangoon for the month of June, 1852.

4th. Major M. Kittoe, reporting on some ancient silver coins found at Majdaha, near Benares, and sending drawings of them.

Ordered that a letter be addressed to the Secretary to Government N. W. Provinces, in the hope of procuring the original coins for the Society’s inspection.

5th. From N. Bell, Esq., Secretary to the Royal Society of London, acknowledging receipt of the Journal Nos. 34 to 48, N. S.

6th. From W. Barlow, Esq., Secretary to the Royal Institution, London, acknowledging receipt of the Journal No. 224.

7th. From J. W. Dalrymple, Esq., Under-Secretary to the Government of Bengal, forwarding, for the information of the Society, copy of a letter from the Secretary to the Board of Revenue with its enclosure, respecting the existence of gold dust in the hill streams of the Char-duar Forest, in Central Assam.

Referred to the Journal Committee.





Mr. Piddington read the following three papers and exhibited the filtering apparatus referred to in one of them.

1st. Description of a cheap and simple apparatus for distilling off the Mercury from an Amalgam of gold or silver.

2nd. On filtering the water of tanks in large quantities for the use of towns.

3rd. On a Geometrical Measurement of the distances from Crest to Crest of the Barometric Waves in a Cyclone.

The Curator of the Zoological Department of the Museum exhibited, in sheets, a copy of his catalogue of birds the publication of which has been delayed by his desire to consult references which have only lately become available.

The Curator of the Museum of Economic Geology and the Librarian having submitted their usual monthly reports the meeting adjourned.

(Signed) J. W. COLVILE.

*Confirmed, September, 1st, 1852.*

#### LIBRARY.

The following books have been added to the Library since June last.

#### *Presented.*

Catalogus Codicum Orientalium Bibliothecæ Academiæ Lugduno Batavae. Auctore R. P. A. Dozy. Vol. II. Lugduni Batavorum 1851, 8vo.—PRESENTED BY THE CURATORS OF THE ACADEMY OF LEYDEN.

Sitzungsberichte der kaiserlichen Akademie der Wissenschaften. Mathematische Naturwissenschaftliche Classe, for 1849-50, (less No. for Dec. 51.) (Nos. 1 to 4 of Vol. VI. and Nos. 3 and 4 of Vol. VII.)—BY THE IMPERIAL ACADEMY OF NATURAL SCIENCES, VIENNA.

Ditto ditto, Philosophisch-historische Classe for 1849-50 and 51, (of Vol. VII. heft. 3, 4 and 5).—BY THE SAME, 50 and 51.

Denkschriften der kaiserlichen Akademie der Wissenschaften. Mathematische Naturwissenschaftliche Classe, Vols. I. and II. and Part 1. of Vol. III.—BY THE SAME.

Ditto ditto, Philosophisch Historische Classe, Vols. I. and II. Parts 1 and 2.—BY THE SAME.

Fontes rerum Austriacarum, österreichische Geschichtsquellen. Zweite Abtheilung Diplomata et acta. III. Band. Liber Foundationis Monasterii Twetlensis. Vienna 1851, 8vo.—BY THE SAME.

Archaeologische Analecten von Joseph Arneth. Wien.—BY THE SAME.

Die Alterthümer von Hallstätter Salzburg und dessen Umgebung. Von Friedrich Simony.—BY THE SAME.

Literaturgeschichte der Araber. Von ihrem Beginne bis zu Ende des





1852.]

*Proceedings of the Asiatic Society.*

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zwölften Jahrhunderts der Hidrehret. Von Hammer Purgstall, 2 Vols. royal 8vo.—BY THE AUTHOR.

Jahrbücher der Literatur for 1849.—BY BARON VON HAMMER PURGSTALL.

Bericht über den zu Kairo in Jahre D. H. 1251, in sechs Foliobanden erschieneen türkischen Commentars des Mesnewi Rumi's von F. Hammer Purgstall.—BY THE AUTHOR.

Annaler for Nordisk Oldkyndeghed og Histoire, Udgivne af det Kongelige Nordiske Oldss-krist Selskab 1849-50. By the Royal Society of Northern Antiquities.

Antiquarisk Tidschrift, 1846-8.—BY THE SAME.

Report of the Royal Society of Northern Antiquities to its British and American Members, 8vo.—BY THE SAME.

Jáska's Nirukta sammt den Nighantavas herausgegeben von Rudolph Roth. Gottingen, 1849.—BY THE AUTHOR.

Report of the Grant Medical College, Bombay, for 1851-2.—BY C. MUREHEAD, ESQ. PRINCIPAL OF THE COLLEGE.

Dr. Cole's Introductory Lecture delivered at the above College on the 14th Jan.—BY THE SAME.

Catalogus van de Bibliotheek der Maatschappij van Nederlandsche letterkunde, te Leiden. Leyden 1847, 3 vols. 8vo.—BY THE SECRETARY OF THE NETHERLAND LITERARY SOCIETY.

Journal of the American Oriental Society, Vol. II. and Part 1 of Vol. III.—BY THE SOCIETY.

Catalogue of the Calcutta Public Library 1846.—BY THE CURATORS OF THE LIBRARY.

Zeitschrift der Deutschen morgenländischen Gesellschaft, Vol. VI. Parts 1, 2.—BY THE GERMAN ORIENTAL SOCIETY.

Premier Memoir sur le Sankhya, par M. Barthelemy St. Hilaire., Paris 1852, 4to.—BY THE AUTHOR.

Histoire des Rois de Kachmir, Vol. III. Paris 1852, 8vo.—BY MAJOR A. TROYER.

The Indian Opium, its mode of preparation for the Chinese Market, from Drawings by Capt. Sherwill. London 1852, 4to.—BY CAPT. SHERWILL.

Philosophical Transactions for 1851, Part II. BY THE ROYAL SOCIETY OF LONDON.

Journal of the Indian Archipelago for March, April and May, 1852.—BY THE EDITOR.

The Calcutta Christian Observer for August, 1852.—BY THE EDITORS.





The Oriental Baptist for August, 1852.—BY THE EDITOR.

The Oriental Christian Spectator for July, 1852.—BY THE EDITOR.

The Upadeshak for August, 1852.—BY THE EDITOR.

An Examination of Religions, Part I. containing a Consideration of the Hindu Shastras in Sanskrit with an English Version and Preface. Mirzapur, 1852, 12mo. 5 copies.—BY THE AUTHOR, THROUGH REV. K. M. BANNERJYA.

The Missionary for August, 1852.—BY THE EDITOR.

Quarterly Journal of the Royal Geological Society of London, Nos. 29 and 30.—BY THE SOCIETY.

Address delivered at the Anniversary Meeting of the Royal Geological Society of London on the 20th of February, 1852, by W. Hopkins, Esq. London, 1852 —BY THE ROYAL GEOLOGICAL SOCIETY OF LONDON.

Bulletin de la Société de Géographie 4me. série Tome II.—BY THE SOCIETY.

Journal Asiatique, Nos. 86 to 89.—BY THE ASIATIC SOCIETY OF PARIS.

Journal of the Agri-Horticultural Society of India. Vol. VIII. Part I.—BY THE SOCIETY.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for June, 1852.—BY THE DEPUTY SURVEYOR GENERAL.

Tattwabodhini Patrikā, No. 108.—BY THE TATTWABODHINI' SHABHA'.

Purnachandrodaya for July, 1852.—BY THE EDITOR.

The Citizen for July, 1852.—BY THE EDITOR.

Bibidhārtha Sangraha, No. 8.—BY THE EDITOR.

*Exchanged.*

The Athenæum from January to May, 1852.

Jamieson's Journal, Nos. 103-4.

London, Edinburgh and Dublin Philosophical Magazines, Nos. 16—20.

*Purchased.*

Bunsen's Egypt, Vol. I.

Mill's History of India, with continuation by Wilson, 9 vols.

North British Review, No. 32.

The Annals and Magazine of Natural History for June, 1852.

Elphinstone's India, 1 Vol.

Birds' Researches into Buddhist Antiquities, 1 Vol. fol.

Comptes Rendus, Nos. 14 to 21.

Journal des Savants for April, 1852.

Havelock's War in Afghanistan.

Fergusson's Illustrations of the Rock Cut Temples of India.

Ihāi-ul-'Olūm by ghazzāly, Arabic MS.

RA'JENDRALA'L MITTRA.





## FOR SEPTEMBER, 1852.

The usual Monthly General meeting of the Asiatic Society was held on the 1st instant at half-past 8 P. M.

Sir JAMES COLVILE, President, in the Chair.

The following visitors were announced, viz. Mr. Gonne on the introduction of Mr. Grote; Mr. Ward on the introduction of Capt. Thuillier. The proceedings of the last meeting were read and confirmed.

Présents were received—

From Mr. W. W. Nicholls, Mission House, Sarawak. The skeleton of an Ourang Outang obtained on the left bank of the Batang Suppar river, in Borneo.

From A. J. M. Mills, Esq. A stone figure of Siva.

From Dr. Morgan of H. M. Ship Fox, through Dr. Fayer. Two Burmese MSS. found in the house of the Governor of Bassien.

Captain W. J. Nicholls, 24th Regiment Madras N. I., proposed and seconded at the last meeting, was balloted for, and elected an ordinary member.

Dr. Morgan, of H. M. Ship Fox, was named for ballot at the next meeting;—proposed by Dr. Sprenger, and seconded by the President.

The President submitted on behalf of the Council the following reports:

1st. Recommending that the offer of Pandita Is'varachandra Bidyáságara to edit the following Nátakas for publication in the Bibliotheca Indica, be accepted.

1. Venisanhára.
2. Anargharághava.
3. Prosannarághava.
4. Nágánanda.
5. Lalitamádhava.
6. Vidagdhamádhava.

2d. Suggesting that the old stock of the Society's Journal be henceforward sold at the following reduced prices, viz.

|                         |   |                              |     |   |    |   |
|-------------------------|---|------------------------------|-----|---|----|---|
| Nos. 110, 118, and 123. | { | To subscribers, at . . . . . | Rs. | 1 | 0  | 0 |
|                         |   | „ Non-ditto, . . . . .       |     | 1 | 8  | 0 |
| Nos. 123 to 227.        | { | To subscribers, at . . . . . |     | 0 | 12 | 0 |
|                         |   | „ Non-ditto, . . . . .       |     | 1 | 4  | 0 |

(Ordered that these recommendations of the Council be adopted).





3d. Bringing to the notice of the meeting the wishes of Lieut. Maury of the National Observatory, Washington, as explained in the following extracts from the letters to Dr. Buist, Secretary to the Bombay Geographical Society, through whom copies of Lieut. M.'s Wind and Current Charts were lately presented to the Society.

"I am very much in want of materials for my charts relating to your seas—and this occurs to me. If you can gain access to any number of old log-books, which contain the direction of the wind once for every eight hours, and which give daily the temperature of air and water, though this last shall not be a *sine qua non*, I will pay for abstracts therefrom at the rate of two cents the day, i. e. suppose the copyist makes the abstract from the log of a vessel that has been 100 days at sea, he will receive therefore £2.

"The tracks which I want on these terms relate to the Indian Ocean only, calling that the Indian Ocean, which extends south from Asia between Africa and New Holland, and which is to the westward of a line drawn from New Guinea to China. This is the region as to which I am most lame of materials, and for abstracts of which I will agree to pay as above, if you deem it expedient to employ one or more copyist on these terms. I have employed copyists at the rate of 2 cents per log, for other parts of the ocean, and a quick writer can easily earn dollars 6, or dollars 8 a day."

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"I am very desirous to obtain some account of the Infusoria in the rain-dust; can you not help me to it?"

Resolved that the Society offer to receive and communicate to Lieut. Maury any information which may be elicited by the publication of the above extracts.

The President then addressed the meeting as follows:—

"I need hardly remind you that since our last meeting, the Society has sustained a great loss by the death of one of its most distinguished and accomplished members, Mr. Henry Torrens.

"On the morning of the day on which we last met, I fully expected to have the pleasure of bringing him hither with me in the evening; you are all probably aware that in the course of that very day he was brought to my house dangerously ill, and that in less than a fortnight he was numbered with the dead.



"I am conscious that there are several here present whose earlier and more intimate acquaintance with Mr. Torrens, and whose longer connection with this Society, make them more competent than I am, both to speak fitly of his brilliant and versatile talents, and of the particular services which, in the period of upwards of fifteen years, during which he was a member of it, he rendered to the Asiatic Society of Bengal; yet I cannot forget that even I had, for nearly seven years, the happiness of possessing his friendship, and of occasionally enjoying his conversation. Since his demise it has been my painful duty to look over some of his note books and unfinished MSS., and I can truly say that that inspection has strengthened the impression which I previously entertained of the wide and diversified range of his knowledge, and of the restless activity of his mind. Again, there is no reason why I should not speak of his labours on behalf of this Society; of them each of us may say *monumenta manent*, and so long as the pages of our Journal, and the collections accumulated in our Museum, shall endure, *monumenta manebant*.

"Mr. Torrens, as many of you know, came to this country at an age somewhat more advanced than that at which the members of his distinguished service generally begin their career. He had completed a classical education at the University of Oxford; he had afterwards mixed more largely than most of his standing, in general Society. He possessed several of the languages of Modern Europe. He was more than commonly conversant with the literature of Europe; yet it must be admitted, that in spite of these manifold distractions he took kindly to the land of his adoption. In truth, the East had many and peculiar charms for his lively fancy and active spirit. Its languages (particularly Arabic and the kindred tongues), its antiquities, its history, its tradition derived from ages when history melts in fable, the origin and distribution of its races—were all subjects of deep and constant interest to him. It is not for me to assign a precise value to his labour as an Orientalist. Those, however, if such there be, who would look at his works of this kind with a critical eye, and contrast them with the productions of more profound and laborious scholars, would do well to recollect that they were the fruits of hours snatched from the claims of official life, and that these various studies were combined with the cultivation of general literature, with researches into military history—



to the study of which he was attracted by the memory of his distinguished father,—nay more, with devotional duty paid at the shrines of the lighter Muses, and with excellence in more than one of the graceful arts which contribute so much to the enjoyment of social life.

“But it is not merely as one of its most accomplished members that Mr. Torrens claims from the Society, the tribute of its regret. For nearly six years he served it as Honorary Secretary. Now, in every numerous body there must be differences of opinion, and these differences will beget opposition, and it may be that some of those who now hear me, may have heretofore objected to this or that detail of Mr. Torrens’s administration. I think, however, that all, who look but candidly upon that portion of the Society’s history, will admit, that if there were any faults in his administration, they were the faults of a generous temper, which in aiming at great ends, does not very nicely calculate the means, and that in all he did, he was animated by a sincere and zealous desire to maintain and extend the reputation and usefulness of this Society.

“I find that on the occasion of his retirement in 1846, from the Office of Secretary, a general meeting of the Society came to this resolution.

“That the Asiatic Society of Bengal, on the occasion of their being deprived of Mr. Torrens’s services as their Honorary Secretary, do hereby record their grateful sense of the distinguished zeal and ability with which, for several years, he has conducted the duties of that office. And as a testimonial of their respect, they further resolve to elect Mr. Torrens an Honorary Vice-President of the Society, and they solicit that, in this capacity, he will continue to afford them his highly valuable co-operation in the prosecution of the numerous objects of literary and antiquarian research, which he has already pursued with such eminent success.”

“I am sure that none will, now that he has been taken from us, be disposed to dissent from those terms of praise, with which the Society recognised the value of his services whilst they were yet recent, and he yet alive, and certain I am, that, even if any there be who may think that in the warmth of friendship I have said anything which their colder judgment cannot approve, there are none who will dissent from the more measured terms of the resolution, which I have now the honour to propose, which are ;—



"That this meeting desires to record its sense of the loss which the Asiatic Society of Bengal has sustained by the death of Henry Whitlock Torrens, Esq. B. C. S., who was for upwards of fifteen years an accomplished and distinguished member of the Society, and whose eminent services when holding the office of Honorary Secretary were, on his retirement from that office in November, 1846, especially acknowledged in the resolution then recorded by the Society."

The resolution having been seconded by Mr. J. R. Colvin was carried unanimously.

Read letters—

1st.—From Mr. Beale, Agra College, inclosing a paper on the Influence of the moon on the Weather, in continuation of Mr. Middleton's observations on the same subject, for the year 1852.

2nd.—From F. Skipwith, Esq., Sylhet, enclosing a rough and imperfect copy of an inscription on a stone, at a place called Laur, in Sylhet, and announcing that Captain Cave intends ere long to visit the spot personally, and to communicate to the Society the result of his visit.

3rd.—From Dr. Fayrer, Rangoon, forwarding a Meteorological Register kept at the Field Hospital, Rangoon, for the month of July.

Subjoined is an extract from a private letter of Dr. F. to Mr. Blyth regarding the apparatus exhibited at the July meeting.

"The instrument sent down to you as for containing poison, is a very different thing. It is for making fire by compressing the air suddenly. A piece of cotton being stuck on the end of the piston, it is suddenly forced down and withdrawn at the same instant. The cotton comes out ignited. I have lit dozens of cheroots with that very one. It is wonderfully ingenious for a savage to have found out. I have seen a complicated brass instrument in lecture-rooms at home that did not do it a bit better."

4th.—From Dr. Bedford, sending an English translation, by Sub-Assistant Surgeon Buddinauth Birmo, of a Mugh system of medicine. Referred to the Council.

Reports having been received from the Librarian and the Curator of the Zoological Department, the meeting adjourned.

(Signed) WELBY JACKSON, V. P.

Oct. 6th, 1852.



## LIBRARY.

The following books have been added to the Library since July last.

*Presented.*

Catalogue of the Stars near the Ecliptic, observed at Markree during the years 1848, 1849, and 1850, and whose places are supposed to be hitherto unpublished. Vol. I. containing 14,888 stars. Dublin, 1851. Presented by order of the British Government.

Meteorological Observations made at the Meteorological Bungalow on Dodobetta, 8,640 feet above the level of the sea, in the years 1848—50, under the direction of the late T. G. Taylor, and of W. S. Jacob. Madras, 1852, 4to. By the Madras Government.

Rapport adressé a M. Directeur General des Musées Nationaux, sur l'exploration scientifique des principales collections E'gyptiennes renfermées dans les divers Musées Publics de l'Europe, par M. Emmanuel de Rougé. Pamphlet.—BY THE AUTHOR.

Abu 'l Mahasin ibn tagri Bardii Annales, quibus titulus est النجوم الزاهرة في ملوك مصر والقاهرة Tomi I. Partem priorum, ediderunt T. G. J. Juynboll et B. F. Matthes. Lugdunii Batavorum, 1852.—BY THE CURATORS OF THE ACADEMY OF LEYDEN.

Oriental Christian Spectator for August, 1852.—BY THE EDITOR.

The Bibidhārtha Sangraha, No. 9.—BY THE EDITOR.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the months of June and July, 1852.—BY THE DEPUTY SURVEYOR GENERAL.

The Citizen newspaper for July, 1852.—BY THE EDITOR.

The Purnochandrodaya newspaper for July, 1852.—BY THE EDITOR.

*Exchanged.*

The London, Edinburgh, and Dublin Philosophical Magazine, Nos. 21, 22. Jamison's Journal for July, 1852.

*Purchased.*

The Edinburgh Review, No. 195.

Halhed's Gentoo Law.

Annals and Magazines of Natural History for July, 1852.

Comptes Rendus, Nos. 22—25.

Journal des Savants for May and June, 1852.

Humboldt's Cosmos, by Mrs. Col. Sabine, Vol. III. p. 2.

RAJENDRA'LA'L MITTRA.



# Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of June, 1852.

| Observations made at Sun-rise. |         |         |          |                        |                  |                     |         |         |          | Maximum Pressure observed at 9 h. 50 m. |                |                     |         |         |          |                    |                |              |      | Observations made at Apparent Noon. |       |          |                |  |  |  |  |  |  |
|--------------------------------|---------|---------|----------|------------------------|------------------|---------------------|---------|---------|----------|-----------------------------------------|----------------|---------------------|---------|---------|----------|--------------------|----------------|--------------|------|-------------------------------------|-------|----------|----------------|--|--|--|--|--|--|
| Temperature.                   |         |         | Wind.    |                        | Aspect of Sky.   | Temperature.        |         |         | Wind.    |                                         | Aspect of Sky. | Temperature.        |         |         | Wind.    |                    | Aspect of Sky. | Temperature. |      |                                     | Wind. |          | Aspect of Sky. |  |  |  |  |  |  |
| Bar. red. to 32° F.            | Of Mer. | Of Air. | W. Bulb. | Direction at Sun-rise. |                  | Bar. red. to 32° F. | Of Mer. | Of Air. | W. Bulb. | Direction at 9h 50m.                    |                | Bar. red. to 32° F. | Of Mer. | Of Air. | W. Bulb. | Direction at Noon. |                |              |      |                                     |       |          |                |  |  |  |  |  |  |
| Inches                         | °       | °       | °        |                        |                  | Inches              | °       | °       | °        |                                         |                | Inches              | °       | °       | °        |                    |                | Inches       | °    | °                                   | °     |          |                |  |  |  |  |  |  |
| 29.738                         | 83.3    | 83.5    | 79.6     | S. E.                  | Clear            | 29.813              | 89.2    | 91.6    | 83.5     | S. W.                                   | Cumulo-strati  | 29.788              | 93.0    | 94.0    | 84.5     | S. E.              | Cumulo-strati  | 29.788       | 93.0 | 94.0                                | 84.5  | S. E.    | Cumulo-strati  |  |  |  |  |  |  |
| .727                           | 80.2    | 80.1    | 77.0     | S. E.                  | Ditto            | .774                | 88.1    | 90.2    | 83.5     | S.                                      | Ditto          | .674                | 92.5    | 93.6    | 85.5     | S. S. E.           | Ditto          | .674         | 92.5 | 93.6                                | 85.5  | S. S. E. | Ditto          |  |  |  |  |  |  |
| .623                           | 82.6    | 83.1    | 81.0     | S. E.                  | Ditto            | .682                | 89.8    | 92.5    | 84.5     | S. E.                                   | Cumuli         | .645                | 93.3    | 94.5    | 86.5     | S. E.              | Cumuli         | .645         | 93.3 | 94.5                                | 86.5  | S. E.    | Cumuli         |  |  |  |  |  |  |
| .613                           | 84.3    | 84.3    | 81.7     | S. E.                  | Cumuli           | .642                | 91.2    | 93.0    | 86.1     | S. E.                                   | Clear          | .623                | 94.9    | 95.0    | 88.0     | S. E.              | Clear          | .623         | 94.9 | 95.0                                | 88.0  | S. E.    | Clear          |  |  |  |  |  |  |
| .563                           | 85.0    | 85.1    | 83.0     | S. E.                  | Cloudy           | .624                | 90.7    | 92.1    | 85.8     | S. S. E.                                | Cumuli         | .617                | 94.0    | 95.1    | 87.0     | S. E.              | Cumuli         | .617         | 94.0 | 95.1                                | 87.0  | S. E.    | Cumuli         |  |  |  |  |  |  |
| .555                           | 84.5    | 85.0    | 82.5     | S.                     | Ditto            | .643                | 90.3    | 93.0    | 84.6     | S. S. E.                                | Cumulo-strati  | .621                | 90.5    | 94.5    | 85.6     | S. E.              | Cumulo-strati  | .621         | 90.5 | 94.5                                | 85.6  | S. E.    | Cumulo-strati  |  |  |  |  |  |  |
| .573                           | 84.6    | 85.0    | 82.0     | S.                     | Cumulo-strati    | .611                | 90.0    | 90.9    | 83.7     | S.                                      | Ditto          | .564                | 92.9    | 93.8    | 84.2     | S. E.              | Cumuli         | .564         | 92.9 | 93.8                                | 84.2  | S. E.    | Cumuli         |  |  |  |  |  |  |
| .493                           | 77.5    | 77.5    | 72.5     | S. E.                  | Cloudy           | .583                | 81.3    | 84.6    | 79.0     | S. E.                                   | Cloudy         | .563                | 87.0    | 88.0    | 81.4     | S. E.              | Cloudy         | .563         | 87.0 | 88.0                                | 81.4  | S. E.    | Cloudy         |  |  |  |  |  |  |
| .583                           | 78.3    | 78.3    | 76.4     | S. E.                  | Cirro-cumuli     | .689                | 85.8    | 88.0    | 81.0     | S. E.                                   | Cumuli         | .652                | 90.4    | 91.7    | 82.6     | S.                 | Cumuli         | .652         | 90.4 | 91.7                                | 82.6  | S.       | Cumuli         |  |  |  |  |  |  |
| .635                           | 83.2    | 83.3    | 81.2     | S.                     | Scattered clouds | .674                | 89.2    | 90.4    | 84.0     | S.                                      | Cumulo-strati  | .643                | 92.5    | 93.8    | 82.8     | S.                 | Cumulo-strati  | .643         | 92.5 | 93.8                                | 82.8  | S.       | Cumulo-strati  |  |  |  |  |  |  |
| .620                           | 82.8    | 82.9    | 81.0     | S.                     | Cirro-strati     | .649                | 83.4    | 86.0    | 82.4     | S.                                      | Ditto          | .616                | 83.2    | 82.0    | 79.6     | S.                 | Raining        | .616         | 83.2 | 82.0                                | 79.6  | S.       | Raining        |  |  |  |  |  |  |
| .595                           | 81.7    | 81.8    | 80.0     | S. E.                  | Ditto            | .628                | 88.0    | 89.6    | 82.4     | S. S. W.                                | Ditto          | .595                | 91.2    | 92.5    | 82.2     | S. E.              | Cumulo-strati  | .595         | 91.2 | 92.5                                | 82.2  | S. E.    | Cumulo-strati  |  |  |  |  |  |  |
| .609                           | 80.8    | 80.8    | 78.8     | S. E.                  | Scattered clouds | .663                | 85.8    | 87.3    | 83.9     | S. S. E.                                | Cloudy         | .653                | 85.4    | 83.4    | 80.4     | S. E.              | Cloudy         | .653         | 85.4 | 83.4                                | 80.4  | S. E.    | Cloudy         |  |  |  |  |  |  |
| .650                           | 81.3    | 81.4    | 80.4     | E. S. E.               | Cirro-strati     | .662                | 86.4    | 87.0    | 81.6     | S. S. E.                                | Raining        | .620                | 89.6    | 90.9    | 81.9     | N. E.              | Cumulo-strati  | .620         | 89.6 | 90.9                                | 81.9  | N. E.    | Cumulo-strati  |  |  |  |  |  |  |
| .545                           | 82.0    | 82.2    | 81.8     | S. E.                  | Cloudy           | .611                | 89.2    | 81.0    | 79.7     | S. S. E.                                | Cloudy         | .513                | 79.6    | 79.4    | 78.4     | S. S. E.           | Raining        | .513         | 79.6 | 79.4                                | 78.4  | S. S. E. | Raining        |  |  |  |  |  |  |
| .474                           | 80.2    | 80.0    | 79.4     | S. E.                  | Ditto            | .529                | 90.6    | 81.0    | 80.2     | S. E.                                   | Ditto          | .524                | 83.0    | 83.7    | 81.8     | E. S. E.           | Cloudy         | .524         | 83.0 | 83.7                                | 81.8  | E. S. E. | Cloudy         |  |  |  |  |  |  |
| .505                           | 80.4    | 80.4    | 79.0     | S. E.                  | Ditto            | .566                | 80.6    | 80.0    | 81.4     | S. E.                                   | Ditto          | .566                | 83.0    | 83.0    | 81.3     | S. E.              | Ditto          | .566         | 83.0 | 83.0                                | 81.3  | S. E.    | Ditto          |  |  |  |  |  |  |
| .570                           | 79.2    | 79.0    | 77.7     | S. E.                  | Ditto            | .613                | 84.2    | 86.4    | 83.2     | S. E.                                   | Ditto          | .586                | 88.4    | 90.0    | 85.0     | S. E.              | Cumulo-strati  | .586         | 88.4 | 90.0                                | 85.0  | S. E.    | Cumulo-strati  |  |  |  |  |  |  |
| .573                           | 82.2    | 82.6    | 81.2     | S. S. E.               | Scattered clouds | .603                | 87.2    | 87.8    | 82.8     | S. S. E.                                | Cumulo-strati  | .582                | 89.6    | 90.6    | 84.4     | S. W.              | Ditto          | .582         | 89.6 | 90.6                                | 84.4  | S. W.    | Ditto          |  |  |  |  |  |  |
| .537                           | 82.0    | 82.2    | 80.6     | S. S. E.               | Cirro-strati     | .574                | 87.5    | 88.6    | 83.4     | S. S. E.                                | Ditto          | .544                | 90.4    | 91.0    | 83.5     | S. E.              | Ditto          | .544         | 90.4 | 91.0                                | 83.5  | S. E.    | Ditto          |  |  |  |  |  |  |
| .475                           | 81.8    | 81.8    | 80.4     | E.                     | Cloudy           | .555                | 87.0    | 89.0    | 82.8     | E. S. E.                                | Ditto          | .511                | 90.2    | 90.5    | 83.5     | E. N. E.           | Cloudy         | .511         | 90.2 | 90.5                                | 83.5  | E. N. E. | Cloudy         |  |  |  |  |  |  |
| .491                           | 82.1    | 82.2    | 80.6     | N. E.                  | Cirro-strati     | .520                | 86.1    | 87.5    | 82.8     | E. N. E.                                | Ditto          | .481                | 89.6    | 88.0    | 82.0     | E. N. E.           | Cumulo-strati  | .481         | 89.6 | 88.0                                | 82.0  | E. N. E. | Cumulo-strati  |  |  |  |  |  |  |
| .526                           | 81.6    | 81.7    | 80.2     | E. N. E.               | Scattered clouds | .554                | 85.4    | 86.8    | 81.9     | E. N. E.                                | Ditto          | .521                | 88.0    | 88.9    | 82.8     | N. E.              | Ditto          | .521         | 88.0 | 88.9                                | 82.8  | N. E.    | Ditto          |  |  |  |  |  |  |
| .498                           | 81.7    | 81.8    | 80.5     | N. N. E.               | Cloudy           | .527                | 87.2    | 88.7    | 82.6     | E. S. E.                                | Cloudy         | .497                | 90.3    | 91.0    | 83.0     | E. S. E.           | Cloudy         | .497         | 90.3 | 91.0                                | 83.0  | E. S. E. | Cloudy         |  |  |  |  |  |  |
| .445                           | 81.3    | 81.4    | 80.5     | N. N. E.               | Drizzling        | .477                | 84.3    | 84.6    | 81.4     | E. N. E.                                | Cumulo-strati  | .434                | 85.6    | 86.2    | 81.5     | E. N. E.           | Cumulo-strati  | .434         | 85.6 | 86.2                                | 81.5  | E. N. E. | Cumulo-strati  |  |  |  |  |  |  |
| .401                           | 81.3    | 81.2    | 80.0     | E. S. E.               | Scattered clouds | .450                | 85.5    | 87.0    | 82.6     | E. N. E.                                | Cloudy         | .409                | 88.4    | 88.6    | 83.2     | S. E.              | Cumulo-strati  | .409         | 88.4 | 88.6                                | 83.2  | S. E.    | Cumulo-strati  |  |  |  |  |  |  |
| .415                           | 81.4    | 81.6    | 80.6     | E. S. E.               | Drizzling        | .490                | 84.0    | 84.4    | 81.8     | S. E.                                   | Cloudy         | .479                | 85.0    | 85.0    | 81.8     | S. S. E.           | Cloudy         | .479         | 85.0 | 85.0                                | 81.8  | S. S. E. | Cloudy         |  |  |  |  |  |  |
| .515                           | 80.4    | 80.2    | 78.7     | S. S. E.               | Scattered clouds | .573                | 83.3    | 82.3    | 79.8     | S.                                      | Drizzling      | .548                | 83.7    | 83.4    | 80.4     | S. S. E.           | Ditto          | .548         | 83.7 | 83.4                                | 80.4  | S. S. E. | Ditto          |  |  |  |  |  |  |
| .523                           | 80.5    | 80.4    | 78.4     | S. S. W.               | Drizzling        | .579                | 83.3    | 84.8    | 81.2     | S.                                      | Cloudy         | .552                | 86.2    | 85.3    | 81.2     | S. S. W.           | Ditto          | .552         | 86.2 | 85.3                                | 81.2  | S. S. W. | Ditto          |  |  |  |  |  |  |
| .539                           | 81.8    | 81.8    | 80.2     | S. S. W.               | Raining          | .608                | 82.4    | 83.3    | 81.0     | S.                                      | Ditto          | .607                | 83.4    | 83.8    | 81.4     | S. S. E.           | Ditto          | .607         | 83.4 | 83.8                                | 81.4  | S. S. E. | Ditto          |  |  |  |  |  |  |
| 29.553                         | 81.7    | 81.8    | 79.9     | ...                    | .....            | 29.606              | 86.1    | 87.3    | 82.5     | ....                                    | .....          | 29.574              | 88.5    | 89.1    | 82.9     | ....               | .....          | 29.574       | 88.5 | 89.1                                | 82.9  | ....     | .....          |  |  |  |  |  |  |







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*Diary of a Journey through Sikim to the Frontiers of Thibet.—By  
Dr. A. CAMPBELL, Superintendent of Darjeeling—with a Map.  
(Communicated by SIR JAMES COLVILE, KT.)*

(Continued from page 501.)

19th October, Cholamoo Lake, North-East Bank.

Thermometer fell during the night to  $14^{\circ}$ , radiating do. to  $9^{\circ}$ ; a calm night; south-easterly squalls: this morning, bright sunshine, and the clearest of blue skies. All my people are ill with head-ache and vomiting, and quite knocked up from the continued effects of this elevated atmosphere. Elevation of this place 17,500 feet, which is the highest encampment we have had. My eyes are inflamed, and the skin is peeling off my face from the excessively sharp wind and brilliant sun of yesterday; my nose bled profusely this morning; but I have escaped head-ache and other painful symptoms, although we were all day yesterday at elevations of 18,000 feet, and higher. The direction of the Cholamoo Lake is north-east and south-west; it is about two miles long and half a mile broad; sloping banks with occasional rocky belts and swamps characterise the west side. The east side is flat, dry, rocky and barren; a rusty red-coloured rocky-terraced spur from the east end of Kanchanjhow bounds the lake to the west, and divides it from the Yeumtso lake. The most easterly source of the Lachen runs from the east of the Cholamoo Lake; it rises in a



glacier of Donkiah. At present it is a mere rivulet, and never carries much water ; it is joined by the stream from this lake a quarter of a mile below the exit, where the stream is not more than a foot deep, and ten yards across. The Lake has two affluents. The principal one to the westward is from a glacier of Kanchanjhow. The other carries the draining of the Donkiah Pass, which is first collected at its foot in a small, circular deep lake, the outlet of which at present is some feet above the level of the water. Probably it does not overflow in this arid and rapidly evaporating region, except during the height of the rainy season.

We found a bed of grey limestone with traces of small organic remains, in the bed of the eastern source of the Lachen.

I started from camp at 10 A. M. to cross the Donkiah Pass into Sikim, and march to Momay Samdong in the Lachoong valley. It was a delightful day, and it was with great regret I bent my steps to the south. Thibet is no doubt a barren land, and the severity of its climate is adverse to the real enjoyment of life ; but from sunrise till sunset it is indeed a pleasing and happy land to wander over, and although my reason taught me to regard it as little better than a desert, I could never look on its red hills shading off into sapphire blue and perpetual snow, and its yellow downs of scanty grass and scorched herbs lighted up to a dazzling pitch by an unclouded sun and lying under the bluest sky, without declaring that it was highly attractive and almost beautiful.

Hooker is less excited by the novelty of Thibetan scenery than I am ; he is going to ascend a peak of Donkiah near the Pass, and about 20,000 feet, to try and get other sights of Chumulári.

The Donkiah Pass between Sikim and Thibet is over a saddle in a sharp rocky ridge which connects the great Donkiah mountain—misnamed Powhunry by Col. Waugh—with Kanchanjhow ; the direction of this ridge is east and west, and it is thrown off from a great spur of the Donkiah. Elevation of the crest of Pass 18,500 feet. Elevation of the highest peak of Donkiah 23,176 feet. The ascent from our encampment on the Cholamoo Lake was gradual, for about two miles, the ground rocky and almost devoid of vegetation ; another mile of steeper ascent brought me to the foot of the Pass—where vegetation ceased—18,000 feet.



From this point the ascent was exceedingly steep, and the track lay over and among loose stones and rocks of gneiss and quartz. It took me just an hour from the point at which vegetation ceased to get to the summit on an indifferent pony, which I rode almost all the way. My breathing was a good deal affected, and my pulse above 100.

The Thibetan guard lent us six of their yaks to take some of our baggage up the Pass to the Sikim frontier; this is on the crest of the Pass, and marked by cairns of stones; here they deposited the loads, and the drivers could not be prevailed on to take them a step farther, although our coolies were so ill as to be unable to carry the loads. The yaks ascended easily and quickly compared with the men and ponies; but even they appeared to be a good deal affected in their respiration at this elevation. They were eating the snow which lay in patches near the path, as they went back. It was calm and warm, as I ascended the north face, but on the crest a cutting wind from the south made it very cold indeed. There was no snow on the road as I ascended the north face, nor, as I descended, on the south side: but it lay in patches among the rocks all the way on both sides. On the mountain to the west of the Pass, snow lay deep in hollow places to within 300 feet of the smaller lake. These snowed places may have had glacial ice in them, but the surface of the snow was then smooth, and was probably quite recent. There was no vegetation for 500 feet on either side of the crest of the Pass, i. e. north or south faces. The line of vegetation may be estimated at 18,000 feet on both sides.

I reached the top of the Pass at 1 p. m.; all the coolies were up at the same time, but much oppressed in breathing, and suffering excessively from severe head-aches. I had a fine view of the main peak and massive part of Donkiah Lah which lies to the south-south-east of the Pass. Five small lakes, which flow into the Lachoong, and lie about 6 or 800 feet below the top of the Pass, were also in sight. I left Hooker's Barometer for him in a niche of one of the cairns on the top of the Pass, took a last look at Thibet with real regret, and facing a bitter south wind descended into the valley of the Lachoong river along which I travelled to Momay Samdong, reaching it at 5 p. m. The coolies left Cholamoo at 8 a. m., crossed the Pass at 1 p. m., and reached Samdong at 6 p. m. The distance is not more than thirteen miles.



The descent from the Pass on the Sikim side is steep and rocky like the north side. The top of the Pass is 800 or 1000 feet above Cholamoo Lake, something less perhaps above the Lachoong lakes. On descending into Sikim—800 feet or so—the change from Thibet is already apparent. Instead of the red colour and friable structure of the Thibet hills, and the sandy soil of its downs tinged yellow with scorched grass and a few herbs, we find grey gneiss with a black peaty soil, and vegetation still alive, although now browned with winter tints. Instead of a clear sky, bright sun and dry atmosphere, we had, a couple of miles down the valley, a thick mist and heavy clouds upon the mountains;—vegetation increased gradually as we came along; first it was composed of grass and sedges only, then the dwarf rhododendrons appeared, and increased as we came down until it quite covered the hills about Samdong road—good enough for ponies—from the Lachoong Lake. There is one hut built of stone partially roofed with boards at Samdong, and no other habitation or shelter. We pitched a tent for ourselves, leaving the hut for our people.

*October 20th.*

*Momay Samdong*, elevation 16,000 feet. We halt here to-day, to allow our people to recover from their head-aches and the other distressing symptoms produced by travelling at our late high elevations, and by the great cold they have been exposed to. Nurkoo, a Lepcha of mine, was so ill yesterday at Cholamoo that I feared for his life. He had the worst symptoms of apoplexy without a thumping pulse, and could with difficulty be roused to consciousness. I was afraid to bleed him, but a large dose of jalap helped to do him good, I think, for although he was carried over the Pass, thereby ascending 800 feet more, he was lively when he reached this; but still he had an excruciating head-ache. As I came down the Pass I had to rouse up four coolies who lay on their knees and faces in great pain with head-aches, and to force them to move. This position was much preferred to any other by all the sufferers, who were so listless and sick that if left alone they would not, I believe, have ever moved from where they lay. Although I am subject to severe head-aches under ordinary circumstances, I have escaped them wonderfully here. Rapidity of breathing in all positions and oppression under exercise is all I have felt since leaving Tungu; but I have ridden wherever I could, and this



makes a great difference. The inflammation of the eyes, swelling and peeling of the face, with breaking out of the lips from which I am suffering, are no doubt attributable to the extreme dryness of the air, the cutting wind and the glare of the snow. In Thibet we did not see any snow below 20,000 feet. Bhomtso—18 or 18,500 feet, on the top of which we passed the forenoon of the 18th—had not a particle on it. In the Lachung valley—Sikim—snow is now lying at about 15,000 feet. South of the Himalaya, the quantity of snow that falls is very much greater than in Thibet, and from the greater moisture of the air and cloudiness of the sky, it is not carried off with the rapidity of evaporation which obtains in Thibet, where you do not find a rill even of water from the melting snow. Besides, in Thibet the snow falls in light feathery skiffs and not in flakes. I believe that the lowest snow-line we saw on the mountains to the north of us in Thibet, must have been upwards of 22,000 feet. On the Kambajong range, which, comparing them with Bhomtso, must be 20,000 feet at least, there was not a particle of snow. In Thibet the difference between the wet bulb and the Thermometers in air, was as much as 20 degrees. In Sikim and in this dry part of it—Samdong—the difference to-day is only 6°. We had heavy hoar-frost nightly in Thibet, an hour after sun-rise it was gone, and not a trace of moisture was left on the ground. Ther. to-day at noon 46°, wet bulb 40°; southerly wind. At Yeumtso, at noon on the 17th, Ther. in air 52°, wet bulb 32°, minimum here at night in the open air 22°, minimum at Yeumtso 5°. In a radiating metallic bowl it fell to 2°. It commenced snowing at 1 P. M. to-day and continued to fall till 7 P. M., when it lay 3 or 4 inches thick. Ther. at 5 P. M. 32°: south wind. Elevation of Samdong; 16,000 feet, of Donkiah Pass, say 19,000 feet; yet it was free of snow on the 19th.

*October 21st.*

We march to Yeumtang. The Ther. fell last night to 22°. The mountains down the valley are heavily snowed. Yesterday we went up the bed of a stream north-east of Samdong, to examine a succession of glacial flats or lake-beds, which Hooker had visited in the rains, and was anxious to shew to me. Went to two only, when the snow came on. This stream falls into the Lachoong at Samdong; above the junction there is another flat lake-bed; on leaving our tents at 8 A. M. we went to examine a glacier of Kanchanjhow, which lies to



the north-west of Samdong, and about 2 miles off. The Moraine or rocky bed below the field of ice is about 3 miles long, and 300 to 400 feet high. It is composed of rocks and stones of all sizes loosely huddled together, on the west side of this, and at the foot of the Seeboolah Pass, which leads to the Lachen Valley, is a deep lake, the drainage from which passes through the Moraine above noted, and issues at the east side of it as a large stream. There is a hot spring close by, which throws up air-bubbles from the bottom. Temp.  $104^{\circ}$  at noon; water quite clear; it has a slightly sulphurous smell; no deposit outside; Temp. of the glacial steam  $41^{\circ}$ .

A little lower down there is another hot spring; Temp.  $116^{\circ}$ ; a good water-cress growing round it. Some crystals of sulphur at exit of spring from the rock—and silver dipped in the spring is turned brown by the sulphuretted hydrogen. Both waters are in repute as hot baths. A Lepcha of Hooker's—Chitoong—who lost a Thermometer near the spring, was sent back from Yeumtang to search for it. He found it not far off at dark, but could not return to us that night, and the cold would have probably killed him, if he had lain down to sleep in the open air. He stripped and lay comfortably in the hot bath all night.

There is some good yak grazing at Samdong. The tsalor, faloo, and other dwarf rhododendrons abound round it, and there is a plant very like heather, abundant near the great glacier—an andromeda. The descent of the valley for 3 miles is gradual—both sides are barren and rocky, with scarcely anything on them, except dwarf rhododendrons. This is succeeded for a short distance by some of the shrubby rhododendrons, and some dwarf junipers; when quite suddenly at about 5 miles down, at the turning of a corner, a full mass of fine and varied vegetation is displayed in trees, shrubs and herbs, affording a very fine prospect. Among these are the *Pinus Webbiana*, large and smaller junipers, willows, birches, barbereys, mountain-ash, roses, thistle, honey-suckle, primroses, asters, gentians, the chuka rhubarb, &c.; and this is the character of the valley all the way down to Yeumtang. Distance from Samdong 10 miles. A good riding road all the way along the west bank for 5 miles, when we crossed by a wooden bridge, then our road lay over 3 or 4 spurs abutting on the river, and at 2 miles from Yeumtang it came on a flat expanse—old lake-bed—2 miles broad or so, which continued all the way to the village where the



Lachoong running smoothly is re-crossed to the west bank by a good wooden bridge. The village of Yeumtang has 25 houses built of wooden walls with shingle roofs. They belong to the Bhotias of Lachoong, who are now at that place with their cattle, this being too cold at this season. They migrate up and down the valley from Yeunkta—5 miles above Samdong—to some miles below Lachoong. We reached Yeumtang at 5 p. m. Ther. at 8 p. m.  $40^{\circ}$ , fell during the night to  $34^{\circ}$ . There is some good grazing here, and it is rather a fine place, the valley being nearly two miles broad, with pine forests rising 1,500 or 2,000 feet up the mountains which, above the line of pines, exhibit fine masses of rock topped with snow.

*Yeumtang, 22nd October.*

Halt here to-day. There are some hot springs a mile down the valley, to which our coolies are gone to bathe their swollen faces and sore eyes. Temp. of these springs  $5^{\circ}$  lower than the Samdong ones, when Hooker visited them in September. There are some very bold rocky peaks on the left bank of this valley above the village, which rise probably 5,000 feet above the river.

The pine forest extends to 1,500 or 2,000 feet. Excellent ponies in this valley. The Phipun or manager trades a good deal with Thibet, and into Sikim as low as Singtam only, whence he brings rice for export to Thibet. The other exports are munjeet-madder, a leaf yielding a yellow dye or symplocos, bamboos, rattans and planks for flooring and shingle.

The imports from Thibet are tea, salt, blankets, and some very good pottery. Ther. at 8 p. m.  $38^{\circ}$ . Drizzling rain all the evening.

*October 23rd.*

March to Lachoong. A good deal of snow fell last night on the neighbouring hills, and those to the south. "Black Rock" bears  $159^{\circ}$  S. S. E., Singikamoo Mountain, P. S. just over head bears E. N. E., Singikama-loong P. S. N. E., Latoong Kamboo P. S. S. W. A very fine bright day; start at 9 a. m. by a good road for ponies through a forest of the largest and handsomest trees of *Pinus Webbiana* I have yet seen, with numerous species of rhododendron tree and shrub-roses, birches, maple, &c. Descent gradual. At 3 miles down, found the larch and willows along with *Pinus Webbiana*; old lake-beds frequent, the Lachoong running quietly through them and in rapids by turns.



At 4 miles or so the valley spreads out into a flat grassy space two miles long, and about the same breadth, the Lachoong meandering through it, and its banks studded with clumps of trees and bushes. On the east bank, and about the centre of this flat portion there is a fine cascade tumbling down the face of a precipitous rock from a height of 400 feet. On the west bank and above the flattest part of the valley is a waterfall, which on reaching the level space, runs in a clear and placid stream along its margin, and joins the river some way below. On the south and west of the flat, a stupendous pyramidal mass of dark brown rock rises abruptly to 1,500 feet or more from the green flat.

It is the finest and boldest rocky mass I have ever seen, and if it cannot be strictly called a precipice, it is, to say the least, *very precipitous*.\* Larches in yellow leaf, the *Pinus Webbiana* of darkest green, rhododendrons, willows, maples, with other trees and plants in various tints flourish round its base, and close its sloping flanks. Far up the valley are seen the perpetual snow-peaks of Changookang, and down it—to the east side—the massive mountain of Tunkala of 17,000 feet; on the south east of which there is a pass which leads into Thibet and Choombi. At 4 p. m. we reached Lachoong, which is, I think, altogether the finest place in Sikim.

There is a considerable descent for the last 4 miles.

*October 24th.*

*Lachoong.* Halt here to-day. Elevation 9,000 feet—a bright day with a fine breeze from the south. Temp. at noon 60°; Min. Temp. during the night 42°. The Phipun has presented us with a sheep, a blanket and some butter. The villagers conjointly have presented a large yak, which has been slaughtered, and distributed among our people. In return I gave 20 Rs. which is more than its value.

It is difficult to describe Lachoong; its beauties are so numerous and striking. We are pitched on the west bank of the river on the opposite side from the town or village, which is connected with this by a substantial wooden bridge. The village consists of 40 or 50 good houses, all well and neatly built, the lower story of stone, the upper of posts with lath and plaister walls, the roof of shingles 6 feet long, with a batten ~~and~~ along at 2 feet apart, and held down by rows of stones.

\* Hooker objects to its being called a precipice.



It stands on a terrace about 50 feet above the river. The terrace slopes gently to the north and also to the south. The greater part of the village is on the northern slope, and has a very picturesque appearance as it is approached from the north, as also from this side of the river. The houses are placed at convenient distances, and have trees and shrubs about them. Poplars, magnolia-willows, peaches and barberry are the most conspicuous. Behind the village to the north-east rises a sloping grassy hill, to which clumps of junipers and pines, with numerous yaks grazing on it, give a park-like appearance of great extent and beauty. This open slope ascends to 1,000 feet or so, where it is surmounted by a thick dark green forest of pines, contrasting most pleasingly with the yellow autumnal tints of the pasturage, which is rich and almost rank. Overhanging the village and rising out of the larger grassy slope is a conical grassy knoll, the summit of which is decorated with poles, and large flags, which are printed with texts and prayers from the Buddhist Scriptures. A small monastery stands at its base in a very lovely situation. I visited it. There are only 10 or 15 Monks attached to it, and its library does not exceed 20 volumes. My reception was civil and cordial, as it always has been in the Goombas of Sikim. I was seated on a cushioned bench in the body of the centre room opposite the images and the library-cabinet, and served with hot tea by an old Nun; as soon as I sat down one of the monks squatted cross-legged on the floor, counted his beads and muttered prayers as long as I remained. The same thing was done when I visited the Phipun's house, when tea was served to me in the chapel-part of his house, a priest—his domestic chaplain, officiated. He has 100 volumes of books. The monastery of Lachoong is connected with one at Digarchi, and has no assignment of land in Sikim. The Monks live by alms, and by largesses distributed by the Bhotias of the valley during sicknesses and after deaths. The Phipun's father died here a short time ago. It was said that property to the value of Rs. 1,000 was distributed to the Lamas on the occasion. The greater part by far of this money went to Digarchi; the rest to the local Monks. The total however is greatly exaggerated, I believe.

The cultivation here consists of Buckwheat, which is cut in October, wheat sown in November and cut in May, turnips which ~~are~~ now in season, and a few peas which come in, in the rains. Buckwheat bread



when hot has rather a tempting flavour; but it is bitter to the taste; it is greenish coloured and spongy. Peaches grow, but do not ripen; they are pulled now and partially dried.

The people of this valley live principally on the milk, curd and flesh of their herds of yaks and a few cows which they graze up and down it according to the season, as in the Lachen valley already noticed, and by a small trade with Thibet. There are about 1,000 yaks among them. All the trade with the north is in planks, beams, rattans, bamboos, butter, endicloth, munjeet, rice and some dye-stuffs. They bring down salt, tea, blankets, some skins, and yaks occasionally. Yaks range in Thibet from 8 to 12 a head.

The yaks calve once in two years. They go nine months with young. The Raja of Sikim has 100 in this valley, about the same number in Lachen, 150 in Shanok—a valley west of the Lachen, some in the Ryote valley leading to the Chola Pass, and in the Rungbo valley, which leads to the Yakla Pass. At Jongri also—north west of Darjeeling—he has a herd.

They are quartered on the inhabitants, who tend them and manage the dairy, receiving a small allowance per annum for the labour.

The office of Phipun has been hereditary here for seven generations. The family is of Thibetan origin. No money-revenue is paid to the Raja of Sikim. The payments are in kind only, comprising, ponies, yaks, blankets and salt, in quantities and proportions I could not determine, nor are they fixed, I believe, by any specific agreement; added to this they furnish porters for the use of the Raja without hire, whenever they are called upon. From this valley, as from Lachen, the annual contributions in the shape of revenue are delivered at Chongtam, and are taken thence to the Durbar from village to village by the unpaid people. When the Raja is at Choombi and that place is their destination, the people of both valleys take them to Geree in Thibet. The people of Dobta, a small tract in Thibet held by the Sikim Raja, come to Geree in two journeys, and carry them thence to Choombi in six journeys.

From Lachoong to Geree is four journeys for loaded men, viz. Yeumtang, Momay Samdong, Cholamoo crossing the Donkiah Pass, Geree. From Geree to Choombi 5 or 6 ditto, viz.

1. Nachomo.
2. Linki.



3. Phari.
4. Gallang.
5. Choombi.

From Geree to Dobta 2 ditto, viz. Tagha, Dobta; the route all the way is over a bare plain, i. e. a Thibetan plain, which is very far from being a level one: two streams are crossed, the waters of which run to the west and into the Arun, I believe.

From Kambajong to Phari three journeys, i. e. you leave Geree to the right and go by Nachamo and Linki as to Choombi.

From Kambajang to Giangtchi 5 ditto, viz.

- |                         |                                |
|-------------------------|--------------------------------|
| 1. Tahtcha, . . . . .   | a horse journey, say 20 miles. |
| 2. Wussoh, . . . . .    | ditto ditto ditto.             |
| 3. Kallah, . . . . .    | ditto ditto ditto.             |
| 4. Kamah, . . . . .     | ditto ditto ditto.             |
| 5. Giangtchi, . . . . . | ditto ditto ditto.             |

This route crosses 5 streams which run to the north, feeders of the Painom, I believe, and is occasionally mountainous and level.

From Kambajong to Digarchi 3 ditto, say 60 miles, viz.

1. Hoomah.
2. Rhe.
3. Digarchi.

Direction northerly; all are long horse-journeys; cross 3 streams on the way running north; occasional hills and plains.

*Lachoong 25th.* Halt this day for Hooker to collect seeds for the Kew-gardens, and I also wanted to send Seedlings of pines, junipers and rhododendrons to Darjeeling. We made an excursion towards the Tunkala Pass; it was a beautiful day and the scenery was very fine; a short way above the village we crossed a fine brook on which two shingle huts stood. They covered 4 large manes or praying drums which were turned by the stream. The plan was simple.

The drums, 4 feet long and a foot and half in diameter, revolved vertically from left to right, the lower end of the spindles turned in stones which lay on the ground, the upper in holes cut in a plank which ran along the centre of the hut.

Wooden floats were attached to the spindles a foot above the stone in which they revolved, and the water was turned upon them by bamboo shoots. The plank-flooring of the huts was a foot below the drums.



"Mani Padma Hum," in large letters, was printed on the drums, and all visitors repeat this universal prayer, while they remain at the mane.

There was a well-cut image on stone of Goraknath in one of the huts. From these manes we ascended the open grassy spur on which the monastery stands, and proceeded along a narrow ridge for a mile; then along the north-west bank of the Tunkala stream, and 1,000 feet, above it, through open pasture land varied by clumps of Rhododendrons and larch; a profusion of ornamental plants occupied the open spaces,—prim-roses, asters, lily of the valley, euphorbia, hypericum, &c. &c. The bottom of the valley on both sides of the Tunkala was a dense and noble forest of larch, *Pinus Webbiana*, *Pinus Brunoniana* and *Pinus Kuthrow*. Passing through the pasture-land and still ascending, we came upon the forest which was formed here of numerous species of the tree rhododendrons, Webbiana-pine, maple, birch, mountain-ash, rose, hawthorn, barberry, the small Chinese bamboo, &c. The Webbiana and Brunoniana pines were the finest I have ever seen. Some of the former measured 25 feet in girth, with a clear stem of 60 feet. Its handsome leaves of a damson-blue colour strewn the ground; a purple dye is made from them, which is said to be fast.

About 4 P. M. it became cloudy and we returned; our coolies laden with seeds and seedlings.

We purchased three good skins of the kiang of Thibet to-day, a male, female, and young one, and sent them to Doctor O'Shaughnessy at Darjeeling for the Asiatic Society's Museum. The men who sold them were Thibetan hunters. People who live by hunting in Thibet are called "Hurpo;" they are very numerous; they eat the kiang, and all other animals, use the gun, make their own powder, and are good marksmen: they cultivate and graze sheep occasionally; but live mostly by the chase.

#### *October 26th.*

Marched to *Kedoom*. Started at 10 A. M. and arrived at 3 P. M. Road runs on west bank of Lachoong river, and is good for ponies, half the distance it lies at first over open grassy spurs, and through intervening hollows in which pines, junipers and larches are disappearing, and oaks, tree rhododendrons, magnolias and laurels are increasing rapidly. At Teemoo—a grassy slope 2 miles long and half way—the pines cease along the road, but the sides of the valley for



1,000 feet above, are still covered with them. Considerable descent this far; insects now numerous, and it is getting warm. Cross the Lachoong to east bank by a wooden bridge, ascend and cross a thickly wooded spur, whence descend to a torrent from the east, cross and ascend to Kedoom, the elevation of which is 7,000 feet. Ther. at 6 P. M. 60°, fell at night to 50°—a village of six or eight houses inhabited by Bhotias, who were very civil and cheerful: a good deal of cultivation. The maize, kodu, kowni and amaranthus not yet ripe. The muwwa has been cut. Plantains not good; peaches do not ripen, but are pulled and stored. They are soft and shrivelled.

*October 27th.*

*Chongtam.* Reached this to-day at noon, in three hours from Kedoom, which terminates our exploration of the Lachen and Lachoong rivers which unite here. We have followed the former to its sources in Thibet, and taking up the latter at its origin on the Sikim side of the Donkiah Pass have come along it downwards. This has occupied twenty-two days. Rode our ponies for 2 miles after leaving Kedoom, and sent them back to Lachoong as the road was quite impracticable. At 4 miles crossed to west bank of the Lachoong by a cane suspension-bridge, and kept this side the remainder of the way. Total distance about 7 miles. Two fine cascades fall into the Lachoong at the bridge—W. bank. Heavy forest of birch, alder, oaks, hydrangea, *Bucklandia*, &c., with under jungle of small bamboo all the way, one *Bucklandia* measured twenty-one feet in circumference. The mountains above Chongtam are grassy to their summits—say to 8,000 feet. The ghoral and thar antelopes with the wild goat—jharal—are numerous. Elevation of Chongtam 5,000 feet. Temp. at noon 74°.

The Lachoong Phipun, a very good natured Bhotia, but rather eccentric, took great care of me all the way to-day, helping me over every bad place, and exclaiming at each: "I have but the size of my thumb to do for the Sahib now. Thank God we are near the end of the journey; if any thing should happen him in my district, I would cut my throat:" and then he would give me half dried unripe peaches out of the breast of his greasy Bukoo-Cloak, and expected me to eat them. His district extends from Choongtam to Donkiah, comprising the whole of the Lachoong valley. He rarely leaves Lachoong except to go to Thibet. He felt the heat very much; I enjoyed the genial warmth after our recent freezing.

*(To be continued.)*



*Mohammad's Journey to Syria and Professor Fleischer's opinion thereon.*—By DR. A. SPRENGER.

It has been stated by me in the *Zeitschr. d. deutsch. Morgenl. Gesellsch.*, Vol. III. p. 454, and in my *Life of Mohammad*, p. 79, that Bahyrá, whom ancient Christian writers call Sergius, accompanied Mohammad from Bostra to Makkah on his return from a journey which he made, when twelve years of age, with his uncle Abú Tálíb. Professor Wüstenfeld in Vol. IV. p. 188 of the same journal denies the correctness of this statement. Professor Fleischer, who in a subsequent number, Vol. VI. p. 458, acts as arbitrator between us, allows that Wüstenfeld partly misunderstood the text to which I referred as authority, but, as it behoves an arbitrator, he puts me in the wrong as well, and decides that Bahyrá did not go to Makkah. As the subject is of interest, I insert here the original records with literal translations. But in order to render it easier for the reader to understand the question, I may mention that it hinges on this. We are told that Bahyrá warned Abú Tálíb, the uncle and guardian of Mohammad, against the dangers which awaited his nephew in Syria, and upon this Abú Tálíb caused Mohammad to "return to Makkah with him," رده معه الى مكة. The dispute is whether the pronoun "with him" refers to Bahyrá or to Abú Tálíb, or in other words did Abú Tálíb take his nephew himself back to Makkah, or did he send him back in charge of Bahyrá? Professor Fleischer is of the former, I am of the latter opinion. It will be seen from the perusal of the original records that the question may be simplified by dividing it, viz. Has Abú Tálíb himself taken Mohammad back to Makkah? or has he proceeded on his journey and attended to his mercantile affairs and sent him back? and if the latter, in whose charge has he sent him?

I. Tirmidzy in his *Sonan* edit. Dilly, A. H. 1266, p. 601, has the following tradition.

حدثنا الفضل بن سهل ابو العباس الاعرج البغدادي ناعبد الرحمن بن غزوان نا يونس بن ابي اسحاق عن ابي بكر بن ابي موسى الاشعري عن ابيه قال خرج ابو طالب الى الشام وخرج معه النبي صلى الله



عليه وسلم في اشيّاخ من قُرَيْش فلما اشرّفوا على الراهب هبط فحلّوا  
رحالهم فخرج اليهم الراهب وكانوا قبل ذلك يَمُرُّون به فلا يخرج اليهم  
ولا يلتفت قال فهم يحلّون رحالهم فجعل يتخلّلهم الراهب حتى جاء  
فاخذ بيد رسول الله صلى الله عليه وسلم فقال هذا سيّد العالمين هذا  
رسول رب العالمين يبعثه الله رحمة للعالمين فقال له اشيّاخ من قُرَيْش  
ما علّمت فقال انكم حين اشرّفتُم من العقبة لم يبق حَجَر ولا شَجَر الا خرّ  
ساجدا ولا يسجدان الا للذبي واني اعرفه بخاتم النبوة اسفل من غُصروف  
كَتِفِهِ مثل الثّقّاحة ثم رجع فصنع لهم طعاما فلما اتاهم به فكان هو في رعيّة  
الابل فقال ارسلوا اليه فاقبل وعليه غمّامة تظله فلما دنا من القوم وجدهم  
قد سبقوه الى فئ الشجرة فلما جلس مال في الشجرة عليه فقال انظروا  
الى فئ الشجرة مال عليه قال فبينما هو قائم عليهم وهو يُناشدهم ان  
لا يذهبوا به الى الرّوم فانّ الرّوم ان رأوه عرفوه بالصفة فيقتلونهم فالتفت  
فاذا بسبعة قد اقبلوا من الرّوم فاستقبلهم فقال ما جاء بكم قالوا جئنا  
ان هذا الذبي خارج في هذا الشهر فلم يبق طريق الا بعت اليه باناس  
وانا قد اُخبرنا خبره بعتنا الى طريقك هذا فقال هل خلفكم احد هو  
خير منكم قالوا انما اُخبرنا خبره بطريقك هذا قال افرايتم امرا اراد الله  
ان يقضيه هل يستطيع احد من الناس رده قالوا لا قال فبايعوه واقاموا  
معه قال انشدكم بالله ايكم وليه قالوا ابو طالب فلم يزل يُناشده حتى  
رده ابو طالب وبعث معه ابو بكر بلا لزودة الراهب من الكعلك والزيت  
هذا حديث حسن غريب لا نعرفه الا من هذا الوجه



" I have been informed by Abú-lábbás al-Fadhí b. Sahl A'raj Baghdády who had it from 'abd al-Rahmán b. Ghazwán, and he had it from Yúnos b. Aby Isdaq, and he had it from Abú Bakr b. Abú Músà al-Ash'ary, and he had it from his father that he (Abú Músà al-Ash'ary) said : Abú Tálíb went to Syria and the prophet went with him, in company of several Shaykhs of the Qoraysh tribe, and when they came to the Ráhib\* he came down. They encamped, and he came to them. Though they had frequently passed him before this, he had not been in the habit of coming out to them or of taking any notice of them. The Reporter continues : They encamped and he walked about among them until he came to the prophet, whom he took by the hand saying, This is the greatest man of the worlds, this is the messenger of the Lord of the worlds, God sends him out of mercy to the worlds. Some of the Shaykhs of the Qorayshites said to him, What tells you this? He answered, When you came forth from between those two hills, there was not a tree or a stone which did not prostrate itself before him, and they do not prostrate themselves before any one, but prophets, and I know him by the seal of prophetic mission, which is impressed upon him below the shoulder plates and resembles a pear. Then he returned and prepared food for them, when he brought it, he (Mohammad) was pasturing the camels. The Ráhib said Bring him to me ; Mohammad approached and was shaded by a cloud. By the time he came, the others had retired into the shade of a tree, and when he sat down the shadow of the tree moved to him. The Ráhib said, Look, the shadow of the tree moves towards him. The Ráhib standing up and speaking most impressively continued : Do not go with him to Rúm (the Byzantine empire) for the people of that country when they see him will recognize him by his appearance and will kill him. He turned round and there were seven Rúmees, he went to meet them and said, What is your object in coming here?

\* Ráhib means a month, a hermit and a Christian generally, and Cawma'ah means a monastery and a hermitage, but more frequently the latter, particularly in Persian. Later authors by the way of embellishing the story, place Baḥyrá at the head of a monastery, but according to Zohry apud Sohayly, he was a Jew, and if later authors say he was a converted Jew ; it is not to be supposed that they have any authority, it is merely one of their usual methods of reconciling discrepant accounts. It will be observed that the name of Baḥyrá does not occur in this tradition.



they answered, we have come, for this prophet is coming forth this month (to this country) and consequently men have been sent to every road. We have received intelligence (a description) of him and were sent on this road. The Ráhib said, Is there any one behind you who is better than you? They answered, Yes, the person who has pointed out to us that the prophet would be on this road. The Ráhib said, Do you think that if God wishes to do a thing, any human being can undo it? They answered in the negative. Then acknowledge him as a prophet said the Ráhib and stand by him. Then he said to the Qorayshites, I conjure you by God tell me who is his guardian? They pointed to Abú Tálíb, and he urged him until Abú Tálíb sent him back to Makkah. Abú Bakr sent Bilál with him and the Ráhib gave him provisions and cakes and oil for the road."

This tradition is also in the *Taysyr alwoçúl ilà aloçúl*, p. 458, with some unimportant variants, and there it is stated that it is also contained in the *original* collection of traditions of Razyn (died in 520), and it is also in the *Mishkàt*, Calcutta edition, IV. p. 638, and in Abú Hátim Ibn Habbán who flourished in the third century and quotes Abú Isháq (died in 188) as his authority; it would therefore appear that in the early ages of Mohammanism it was the account most generally believed. The author of the *Içábah* says (apud *Mawáhib allad.*) that the Sanad of this tradition is so strong, that notwithstanding the anachronism which it contains, we must consider it as genuine, and he supposes that the words Abú Bakr and Bilál (the latter of whom was not yet born when Moammad went the first time to Syria) are interpolated. The same seems to have been the opinion of the author of the *Bahjat almaháfil* who follows Tirmidzy, but omits the name of Bilál retaining that of Abú Bakr.

II. The following is the version of the story in Ibn Isháq:

قال ابن اسحق ثم ان ابا طالب خرج في ركب تاجراً الى الشام فلما تهيأ للرحيل واجمع للمسير ضيَّ به رسول الله صلى الله عليه وسلم فيما يزعمون فرَّق له ابو طالب وقال والله لا اخرجنَّ به معي ولا يفارقني ولا افارقه ابداً او كما قال فخرج به معه فلما نزل الرب بصرى من ارض



الشام و بها راهب يقال له بحيرا في صومعة له و كان اليه علم اهل  
النصرانية و لم يزل في تلك الصومعة منذ قطّ راهب اليه يصير علمهم عن  
كتاب فيما يزعمون يتوارثونه كابراً عن كابر فلما نزلوا ذلك العام ببخيرا  
و كانوا كثيرا ما يمرون به قبل ذلك فلا يكلمهم ولا يعرض لهم حتى كان  
ذلك العام فلما نزلوا به قريبا من صومعته صنع لهم طعاما كثيرا و ذلك  
فيما يزعمون عن شئ رآه و هو في صومعته يزعمون انه رأى رسول الله  
صلى الله عليه و سلم حين اقبل و سحابة تظله من بين القوم  
في الركب ثم اقبلوا فنزلوا في ظل شجرة قريباً منه فنظر الى  
الغمامة حين اظلمت الشجرة و تهصرت اغصان الشجرة على رسول  
الله عليه و سلم حتى استظل تحتها فلما رأى ذلك بحيرا نزل من  
صومعته و قد امر بذلك الطعام فصنع ثم ارسل اليهم فقال اني قد صنعت  
لكم طعاما يا معشر قريش فانا احب ان يحضروا كلكم صغيركم و كبيركم  
و عبدكم و حرّكم فقال له رجل منهم و الله يا بحيرا ان لك لشاناً اليوم  
وما كنت تصنع هذا بنا و قد كنا نمرّ بك كثيراً فما شانك اليوم فقال له  
بحيرا صدقت قد كان ما تقول و لكنكم ضيف و قد أحببت ان اكرمكم  
واصنع لكم طعاماً فتاكلون منه كلكم فاجتمعوا اليه و تخلف رسول الله صلى  
الله عليه و سلم من بين القوم لحدائثة سنّه في رحال القوم تحت الشجرة  
فلما نظر بحيرا في القوم لم ير الصفة التي يعرف و يجد عنده فقال  
يا معشر قريش لا يتخلفن احد منكم عن طعامي فقالوا له يا بحيرا ما  
تخلف عنك احد ينبغي له ان ياتيك الا غلام و هو احدث القوم سناً



فتخلف في رحالهم فقال لا تفعلوا ادعوه فليحضر هذا الطعام معكم قال  
فقال رجل من قريش واللات والعزى ان كان للوئماً بنا ان يتخلف ابن  
عبد الله بن عبد المطلب عن طعام من بيننا ثم قام اليه فاحتضنه واجلسه  
مع القوم فلما راه بحيرا جعل يلحظه لحظاً شديداً و ينظر الى اشياء من  
جسده قد كان يجدها عنده من صفته حتى اذا فرغ القوم من طعامهم  
وتفرقوا قام اليه بحيرا فقال له يا غلام اسالك بحق اللات والعزى الا ما اخبرتني  
عما اسالك عنه وانما قال له بحيرا ذلك لانه سمع قومه يحافون بهما  
فزعموا ان رسول الله صلى الله عليه وسلم قال له لا تسالني باللات والعزى  
فو الله ما ابغضت شيئا قط بغضهما فقال له بحيرا فبالله الا ما اخبرتني  
عما اسالك عنه فقال له سلني عما بدا لك فجعل يساله عن اشياء من  
حاله في نومه وهيبته واموره فجعل رسول الله صلى الله عليه وسلم يخبره  
فيوافق ذلك ما عند بحيرا من صفته ثم نظر الى ظهره فرأى خاتم النبوة  
بين كتفيه على موضعه من صفته التي عنده قال ابن هشام وكان مثل  
اثر المحجم قال ابن اسحق فلما فرغ اقبل على عمه ابي طالب فقال  
ما هذا الغلام منك قال ابني قال له بحيرا ما هو بابنك وما ينبغي  
لهذا الغلام ان يكون ابوة حياً قال فانه ابن اخي قال فما فعل ابوة قال  
مات وامه حبلى به قال صدقت فارجع بابن اخيك الى بلده واحذر  
عليه يهود نوالله لين رآه وعرفوا منه ما عرفت ليبدغته شراً فانه كائن لابن  
اخيك هذا شان عظيم فاسرع به الى بلاده فخرج به عمه ابو طالب  
سريعاً حتى اقدمه مكة حين فرغ من تجارته بالشام فزعموا فيما روى



الناس ان زُريرا وتماماً و دريسا و هم نفر من اهل الكتاب قد كانوا راوا  
 من رسول الله صلى الله عليه وسلم مثل ما رأى بحيرا في ذلك السفر الذي  
 كان فيه مع عمه ابي طالب فارادوه فردّهم عنه بحيرا و ذكرهم الله و ما  
 يجدون في الكتاب من ذكره و صفته و انهم ان اجمعوا لما ارادوه لم يخاصروا  
 اليه حتى عرفوا ما قال لهم و صدقوه بما قال فتركوه و انصرفوا عنه فشبّ  
 رسول الله صلى الله عليه وسلم يكلاه الله و يحفظه و يحفظه من اقدار  
 الجاهليه لما يريد به من كرامته و رسالته حتى بلغ ان كان رجلاً افضل  
 قومه مروّة و احسنهم خلقاً و اكرمهم حسبا و احسنهم جواراً و اعظمهم حِلماً  
 و اصدقهم حديثاً و اعظمهم امانة و ابعدهم من الفحش و الاخلاق التي  
 تدنس الرجال تفزّها و تكرّمها حتى ما اسمه في قومه الا الامين لما جمع  
 الله فيه من الامور الصالحة

“ Ibn Ishâq says : After this Abú Tálib went with a body of men riding on camels to Syria on commerce, and when they were preparing for the journey, the prophet clung to him as it is supposed, and Abú Tálib was moved and said, “ I will take him with me and he shall not leave me, nor will I ever leave him,” or some thing to this effect. He went with him. When the caravan halted at Boçrà in Syria, there was a Ráhib of the name of Bahyrá in a hermitage which belonged to him, and to him had descended the knowledge of the Christians. There had always been a Ráhib in that hermitage to whom descended their knowledge (mysteries) there being a book in the hermitage which it is supposed they inherited from each other. When they encamped that year near Bahyrá's hermitage, he prepared for them an ample repast. They had frequently past him, but he never spoke with them nor met them except this year. This, it is supposed was owing to certain things which he observed. It is supposed he saw the prophet from his hermitage as he approached with the caravan, and he was



shaded by a cloud whilst the others were not shaded. Then they approached and encamped under a tree near Baḥyrá and he witnessed how the cloud shaded the tree, and how the leaves became green over the prophet so as to afford him shade. When Baḥyrá saw this, he went down from his hermitage whilst the repast, which he had previously ordered, was being prepared, and went to them and said I have prepared a repast for you, O Qorayshites, and I wish that you may all be present small and great, free men and slaves. One of them said, You are coming out in grand style to-day, O Baḥyrá, you have never done any thing like it, though we frequently passed you, what are you about to-day? "It is true," replied Baḥyrá, "but you are my guests. I wish to honour you and have prepared a repast for you, come and partake all of it." When the others assembled, the prophet stayed away remaining with the baggage under the tree, he being the youngest. When the Ráhib looked about among them he did not observe the signs which were known to him, and which he had found on him, and he said O Qorayshites, has not some one stayed away from my repast? They answered, none has stayed away of those who ought to have come except a boy who being the youngest among us remained with the baggage. Baḥyrá said, do not do so, call him and let him be present at this repast. One of them said By al-Lát and al'ozzá he blames us for not having brought the son of 'abd Allah b. 'abd al-Mottalib to this repast with us. He took him by the hand and made him sit down with the others. When Baḥyrá saw him he looked very attentively at him, and he continued to look at certain peculiarities of his which he had found on him until the repast was over and the people dispersed. Baḥyrá went now to him and said, I conjure you by al-Lát and al'ozzá that you will give me the information which I ask you. Baḥyrá used this expression because he had heard his countrymen swear by those two idols. It is supposed that the prophet answered, Do not ask me by al-Lát and al'ozzá for nothing is more odious to me than these two idols. Baḥyrá said, Then by God give me the information I ask you for. Yes, said Moḥammad ask me by God. Baḥyrá now questioned him regarding his circumstances in sleeping and walking, and the prophet answered his questions, and all agreed with the description which Baḥyrá had of him. Then he examined his back and he saw the seal of prophecy between his two shoulders, precisely



corresponding with the description which he had of him. Ibn Hishám observes that it was like the mark left by cupping. Ibn Ishák continues, when he had done he accosted Abú Tálib and asked what relation this boy was of his. He answered that he was his son. Baḥyrá said, The father of this boy cannot be alive. Abú Tálib allowed that he was his nephew, "what has become of his father?" He died whilst his mother was pregnant with him, replied Abú Tálib. He said "you are right, return with your nephew to your country and take care of the Jews. If they see him and they observe on him the signs which I have observed, they will destroy him. His vocation is high, and therefore hasten back with him to his country," when Abú Tálib had concluded his affairs he returned fast with him to Makkah.

It is related by some that Zorayrá, and Tamám and Darysá, who were three believers in the Bible, observed when Moḥammad was on this journey with his uncle, the same signs which Baḥyrá had observed, and they formed the intention of murdering him, but Baḥyrá turned them away from Moḥammad. He put them in mind of God, and of the description and account given of Moḥammad in the Bible, and he explained to them, that they would not be able to carry their plans into effect. Convinced of what Baḥyrá said, they gave up their pursuit and returned.

Moḥammad grew up and God protected him, took care of him, and guarded him against the contaminations of paganism, on account of the miracles which he intended to work on him. He became distinguished among his countrymen for his humanity, morality of conduct, generosity in his intercourse with others, peacefulness with his neighbours, mildness of temper, and good faith, and truth, and no man was more remote from licentiousness or obscene actions than he; owing to these good qualities with which God had adorned him, he was called al-Amyn (the 'Trust-worthy.')

Ibn Ishák's opinion is supported by Ibn al-Athyr in his *Kámil*, and by Chroniclers who follow Ibn al-Athyr as Abú-l-Fidá, and the author of the *Habyb alsiyár*, but by very few Biographers of Moḥammad; Ibn al-Athyr however gives the wonderful part of Tirmidzy's version of the story as well. Sohayly and the authors of the 'oyún al-Athar of the Tarykh Khamys and of the Insán al'oyún give both the version of Ibn Ishák and that of Tirmidzy, pointing out the anachronism of the latter without impugning the veracity of other details.



III. First tradition of Ibn Sa'd the Secretary of Wáqidy (I usually call him for the sake of brevity Wáqidy) :

اخبرنا خالد بن خدّاش نا معتمر بن سليمان سمعت ابي يحدث  
عن ابي مجاز ان عبدالمطلب او ابا طالب شك خالد قال لما  
مات عبد الله عطف على محمد عليه السلام قال فكان لا تسافر سفراً  
الا كان معه فيه وانه توجه نحو الشام فنزل منزلاً فاتاه فيه راهب  
فقال ان فيكم رجلاً صالحاً فقال ان فينا من يقرى الضيف ويفك  
الاسير ويفعل المعروف او نحواً من هذا ثم قال ان فيكم رجلاً صالحاً  
ثم قال اين ابو هذا الغلام قال فقال هانذا وليه او قيل هذا وليه قال  
احتفظ بهذا الغلام ولا تذهب به الى الشام ان اليهود حسدوا نبي  
اخشاهم عليه قال ما انت تقول ذلك ولكن الله يقوله فردّه قال  
اللهم اني استودعك محمداً ثم انه مات •

“I have been informed by Khálid b. Khodásh on the authority of Mo'tamir b. Solaymán, who said that he heard his father relating from Abú Moljaz that 'abd al-Mottalib or Abú Talib [Khálid doubts which of the two] was kind to Moḥammad after the death of 'abd Allah (his father), and, he continues, he did not go on a journey but he took him with him, one day he went to Syria, and he encamped in a place, and there came a Ráhib (hermit or monk) to him and said; “there is a godly man among you.” The Arab answered, “there are men among us who are hospitable, and release prisoners and do what is right,” or some thing to this effect. He repeated “There is a godly man among you,” and continued “where is the father of this boy?” The Arab answered, “I am his guardian” or it was said, “This is his guardian.” The Ráhib said, “Take care of this boy, do not take him to Syria, the Jews are jealous of him, and I am afraid of them for him.” The Arab answered, “It is not you who says this, but it is God” and he caused him to return to Makkah. The hermit said, “O God, I commend to you Moḥammad” and died.



IV. Second tradition of Ibn Sa'd (i. e. the Kátib of Wáqidy).

احبرنا محمد بن عمر حدثني محمد بن صالح بن عبد الله بن جعفر  
و ابراهيم بن اسماعيل بن ابي حبيب عن داود بن الحصين قالوا  
لما بلغ رسول الله صلى الله عليه وسلم اثني عشرة سنة خرج به  
ابو طالب الى الشام في العير التي خرج فيها للتجارة و نزلوا  
بالراهب بحيرا فقال لابي طالب في النبي صلى الله عليه وسلم ما  
قال و امره ان يحتفظ به فردّه ابو طالب معه الى مكة و شب  
رسول الله صلى الله عليه وسلم مع ابي طالب يكلوه الله و يحفظه  
و يحوطه من امور الجاهلية و معايبها لما تريد به من كرامته و هو  
على دين قومه حتى بلغ ان كان رجلاً افضل قومه مروءة و احسنهم  
خلقاً و اكرمهم مخالطة و احسنهم جواراً و اعظمهم حلماً و امانة و اصدقهم  
حديثاً و ابعدهم من الفحش و الاذى ما رنى ملاحياً ولا ممارناً  
حتى سماه قومه الامين لما جمع الله له من الامور الصالحة فيه  
فلقد كان الغالب عليه بمكة الامين و كان ابو طالب يحفظه و يحوطه  
و يعضده و ينصره الى ان مات •

“I have been informed by Moḥammad b. 'omar (i. e. Wáqidy) that he was informed by Moḥammad b. Ḡálih b. 'abd Allah b. Ja'far and by Ibráhyim b. Ismáyl b. Abú Habyb who (both) had it from Dáwúd b. al-Ḥoṣayn: when the prophet was twelve years of age Abú Tálíb took him to Syria in company with the caravan with which they proceeded thither for the sake of commerce, they encamped at the Ráhib Baḥyrá, and the Ráhib told Abú Tálíb regarding the prophet what he told him, and recommended him to take care of him, and in consequence he (Abú Tálíb) caused him (Moḥammad) to return to Makkah with him. The prophet grew up with Abú Tálíb and God protected him, and took care of him, and guarded him against the practices of paganism and its abominations, on account of the



miracles which he intended to work on him. But he followed nevertheless the religion of his countrymen. But he became under the protection of God, distinguished among them for his humanity, morality of conduct, generosity in his intercourse with others, peacefulness with his neighbours, mildness of temper and good faith and truth, and no man was more remote from licentiousness or obscene actions than he, he was never seen disputing or quarreling with any one. Owing to these good qualities with which God had adorned him, he was called al-Amyn (the Trust-worthy) and he generally went in Makkah by this name. Abú Tálíb guarded him, and took care of him, and supported him, and assisted him, and until he (Abú Tálíb) died."

No author I know of, except Ibn Hajr, even alludes to\* these two traditions of Ibn Sa'd because the statement that Mohammad was an idolater, was a scandal in the eyes of the true believers. They do not follow the traditions of Wáqidy because they are too true, and they distrust the version of Ibn Ishák because the falsehood is too glaring and it is perfectly unsupported by authority.

V. In the Mawáhib alladonayyah the commencement of another original record is mentioned which it would appear has been preserved by Ibn Aby Shaybah it runs :

وَلَمَّا بَلَغَ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ اثْنَا عَشْرَةَ سَنَةً خَرَجَ مَعَ عَمِّهِ أَبِي طَالِبٍ إِلَى الشَّامِ حَتَّى بَلَغَ بَصْرَى فَرَأَاهُ بِحَيْرِ الرَّاهِبِ وَاسْمُهُ جَرَجِيسُ فَعَرَفَهُ بِصَفْتِهِ فَقَالَ وَهُوَ آخِذٌ بِيَدِهِ هَذَا سَيِّدُ الْعَالَمِينَ هَذَا يَبْعَثُهُ اللَّهُ رَحْمَةً لِلْعَالَمِينَ فَقِيلَ لَهُ وَمَا عَلَيْكَ بِذَلِكَ فَقَالَ أَنْكُمْ حِينَ أَشْرَفْتُمْ بِهِ مِنَ الْعَقْبَةِ لَمْ يَبْقَ شَجَرٌ وَلَا حَجَرٌ إِلَّا خَرَّ سَاجِدًا وَلَا يَسْجُدُ إِلَّا لَذَنبِي وَإِنِّي أَعْرَفُهُ بِخَاتَمِ النُّبُوَّةِ فِي أَسْفَلِ مَنْ غُضُرُوفِ كَتَفِهِ مِثْلَ التَّفَاحَةِ وَأَنَا نَجْدَةٌ فِي كَتَبِنَا وَسَأَلَ أَبَا طَالِبٍ أَنْ يَرُدَّهُ خَوْفًا عَلَيْهِ مِنَ الْيَهُودِ .  
لِحَدِيثِ رَوَاهُ ابْنُ أَبِي شَيْبَةَ .

This tradition has been copied with a few variants by Nawawy *Biogr. Dict.* edit. Wüstenf, p. 32, but the authority is not stated there, and we find an addition which is to our purpose, viz, فردّه "and consequently Abú Tálíb *did send* him back." If فردّه is to be translated "and consequently he *took* him back to Makkah," it implies that he had intended to leave him in Syria. This version is partly support-



ed by Abú l-Sa'adat Ibn al-Athyr. He says in his *Jámi'aloçul*, II. 3 :  
 وكان خرج به عمه ابو طالب تاجرا الى الشام وله ثلث عشرة سنة فواى بحيرا  
 الراهب يتيما فعرفه بعلائم النبوة والصفة التي عنده فلم يزل يناشد ابا طالب  
 حتى رده الى مكة فاقام يوما الى ان بلغ خمسا وعشرين سنة

"His uncle Abú Tálib was gone with him to Syria on commerce. He was then thirteen years of age, the Ráhib Baḥyrá saw him and observed that he was an orphan, and he recognized him by the signs of prophecy, and by the description which he had of him, and he did not cease to urge upon Abú Tálib until he (Abú Tálib) caused him to return and he remained at Makkah until he was twenty-five years of age."

These are all the *original* accounts which are available for me. Tabary furnishes no additional information. This historian usually gives all the conflicting traditions on a question, and then his own views thereon. It is likely that he has done the same in this instance. He gives the story in the version of Ibn Isháq, but unfortunately just where it ends, two pages are wanting in my MS. These two pages in all probability contained the other versions current in those days.

All accounts agree that Mohammad instead of proceeding on his journey precipitously returned to Makkah, some say from Balqá, others from Kafr, and others say from Bostra, and it is this circumstance which served as a peg on which to fasten the marvelous portion of the story, Baḥyrá's recognition of the prophet in the boy. It will probably never be possible to ascertain the *real* cause of this precipitous return, but that Abú Tálib took measures that his nephew should return to Makkah sooner than it was originally intended, is certain, unless the whole journey is a fiction.\* In the first two traditions, it is

\* It is stated in the Içábah that there is a tradition extant, resting however on weak authority that Mohammad met Baḥyrá again, when he went the second time to Syria for Khadyjah. The Biographers of Mohammad state that he met in his second journey to Syria, the monk Nestúr and they repeat nearly the same miracles and adventures, which they relate of his first journey. Maracci has thereby been induced to identify Baḥyrá and Nestúr, and to suppose that Nestúr means simply that Baḥyrá was a Nestorian. Considering that the oldest and most authentic tradition on this journey that of Tirmidzy, contains the greatest number of marvels, it is not at all unlikely that the first journey to Syria is altogether apocryphical and that it has been invented with the view of covering the real facts regard-



distinctly expressed, and in the last two Abú Tálíb immediately assents when Bahyrá urges the necessity, that he should leave Syria without delay. Leaving Wáqidy's traditions out of the question, the statement as to whether he was sent back by Abú Tálíb, or whether Abú Tálíb went himself back with him are divided. Abyáry and the authors of the *Rawdhat al-Akbáb*, of the *Madárij alnobúwat*, of the *Ma'árij alnobúwat*, and of the *Rawdhat alçafâ*, first Bombay edit. II. p. 38, and of the *Insán al'oyún* say, that there are two versions extant, viz. some say that Abú Tálíb went himself, others that he sent him back with a body of men and continued his journey to Syria. The words of Abyáry are, *فَعِنْدَ ذَلِكَ قِيلَ بَعَثَهُ أَبُو طَالِبٍ مَعَ بَعْضِ غُلَمَائِهِ إِلَى الْمَدِينَةِ وَقِيلَ خَرَجَ بِهِ* and the words in the *Madárij* are, *پس ابوطالب متاع خود را در بصری بفروخت و بمکه باز گشت و* *روایتی آنست که ابوطالب آن حضرت را بجماعت بجانب مکه باز گردانید و خود بطرف شام رفت* Kázerúny in the Persian translation, and the author of the *Tarykhe Ja'fary* avoid the difficulty, the former by saying "they took him back باز آوردند without delay to Makkah," and the latter by saying "he went back to Makkah."

The balance of evidence however is decidedly in favour of Mohammad's having been *sent* back, and that Abú Tálíb continued his journey and attended to his affairs, for we have exclusive of Wáqidy's tradition, two original accounts, that of Tirmidzy, and that of Ibn Aby Shaybah condensed by so high authorities as Nawawy and Abú Sa'adat against the single testimony of Ibn Isháq, which is supported only by men who have not made a special study of the traditions, and of the biography of the prophet. Probability too is in favour of his having been *sent* back. The roads from Syria to the *Hijáz* were safe, being under the protection of the Ghassánite kings, and the intercourse was very frequent, so that there would have been constantly opportunities of sending back a boy who being twelve years of age, could take care of himself. It would have been perfectly superfluous for Abú Tálíb to retrace his steps himself a day sooner than he found it expedient. If it

ing Mohammad's connexion with Sergius, which began on his journey for Khadyjah. It is remarkable that in the 70th chapter of Mas'údy and in Bal'amy's *Tabary* only the second journey is recorded, and that no mention is made of the first.



should be said, he did not return before it was convenient, I would answer there was no necessity for prominently mentioning that Mohammad returned to Makkah unless Abú Tálíb intended to leave him in Syria and this was certainly not the case.

Wherever the word *رجع* occurs in connexion with this story if translated by "Abú Tálíb went back with him," it would give a forced unnatural and incomplete sense, and I therefore think, that it is invariably to be rendered by "he sent him back." Thus clearest of all in Tirmidzy (p. 578 *supra*), but also in the first tradition of Wáqidy, thus in that of Ibn Aby Shaybah, thus in Nawawy, and thus in Abú-l-Sa'ádat, and finally thus in the second tradition of Wáqidy, where *رجع* can have no other meaning than Abú Tálíb sent Mohammad back to Makkah with Bahyrá, *hoc est quod erat demonstrandum*.

But there are much stronger grounds in support of my opinion. The Christians of Syria charged the prophet of the Musalmáns with having received his inspirations from an apostate Christian monk of the name of Sergius. I believe the first author who mentions this fact is Joannes Damascenus, who lived at the court of the Omayyide Kálifs. He was prior to any Arabic biographer of Mohammad, and had the very best opportunities of obtaining information. But having no books to refer to, I am unable to ascertain whether Sergius is mentioned by him and in what terms. It is however of no consequence by which Christian author the fact is first mentioned, for we obtain a testimony from the camp of the enemy. Mas'údy who wrote in the first half of the fourth century of the Hijrah, tells us very significantly, that Bahyrá was the person whom the Christians call Sergius. Well, the Christians were talking at that time with the Mohammadans of a Sergius. This is quite enough for our purpose. Mas'údy, Ibn Bába-wayh and others place Bahyrá among those men whom Mohammad and his followers venerated, because they believed in the unity of God (denying the trinity), and were in fact Moslims before he received his mission. Ibn Qotaybah, edit. Wüstenf. p. 28, my edit. p. 41, the earliest Mohammedan historian, whose work we have, unwittingly confirms this statement. Are we to believe the fables which the Musalmáns tell us regarding Bahyrá, or are we to suppose that there was another cause for his canonization than one incidental meeting with the prophet and his phrenologizing on him, and pointing out the pomps on his back



as Ibn Isḥāq would have it? Or are we in spite of the sickly liberality of modern times, to give due weight to the charges of the Christians against him, and suppose that the esteem which the Musalmāns had in the earliest time for Sergius, was due to his connexion with Moḥammad of which later ages were ashamed, being anxious to make their prophet more and more supernatural. One tradition makes Baḥyrá die to get rid of the charge, another sends Bibál, who was not yet born with Moḥammad to Madynah, and a third one sends Abú Tálíb himself. The last version runs smoothest, but it is the latest. The fact of Moḥammad's having been *sent* back to Makkah by Abú Tálíb was probably too well known in the earliest ages of the Islám, than that it would have been safe then to invent it.

But even Arabic authors afford us some proofs that Baḥyrá was at Makkah during the time of Moḥammad. In the *Rawdhat alaḥbáh* he has the Kunyah of Abú 'addás, that is to say, it is stated that he was the father of 'addás, and we find at Makkah a Christian of that name who plays a most mysterious part in the life of the prophet. Surely had Ibn Isḥāq not had some thing to conceal regarding him, he would not have trespassed so far on our credulity, as to try to make us believe that though 'addás had all along lived at Makkah, it was only eleven years after Moḥammad had proclaimed himself a prophet that he heard of it the first time!—If my memory does not deceive me, Baḥyrá is mentioned in a Zaydian chronicle, which had been lent to me by the late Mowlawý 'abd al-Raḥym, among those persons who died between the first revelation and the assumption of the prophetic office of Moḥammad. Ibn *Hajr* says of Baḥyrá in the *Iḥábah* ما ادري *ادري* "I do not know whether he lived to the mission or not." An important fact is related in the *Iḥábah* on the authority of Máwardy and Abú Músà. Abrahah the king of Abyssinia sent a deputation to Moḥammad which was headed by Ja'far, among those who composed it, we find the name of Baḥyrá. The learned Ibn al-Athyr identifies him with Baḥyrá of Bostra. The author of the *Iḥábah* thinks, that they are two distinct persons, but his sole reason for such distinction is, that the one was in Abyssinia, and the other in Syria. If Baḥyrá came to Makkah with Moḥammad, and remained there until the persecution against the new doctrine began, he would have had no other choice than to take flight to Abyssinia with or before the other



Musalmáns who had no protection, this reason therefore falls to the ground.

It has already been stated that the tradition of Tirmidzy is the most authentic. It was in the third century of the Hijrah traced through different authorities to 'alyy (see 'Taysyr) and to Abú Músà Ash'ary, and we have evidence that it had been taken to paper at the very latest, about the middle of the second century. The first tradition of Wáqidy p. 585 and that taken from the Mawáhib do not essentially differ from it, and may be considered condensed fragments of the same tradition.

The second tradition of Wáqidy bears equally the stamp of high antiquity, and admitting as it does that Moḥammad was in his youth an idolator ~~that~~ of truth. Moreover it had been handed down by the most respectable authorities. Wáqidy who was born in A. H. 130 had it from two men, who cannot be supposed to have conspired to deceive him, this version of the story must therefore have existed in the first century of the Hijrah.

It appears then that in the first century, two versions were extant, represented by Tirmidzy and Wáqidy, and on examining the account of Ibn Isháq, we find that it is composed of these two. The first part contains an embellished version of Tirmidzy's tradition, and the conclusion agrees literally with Wáqidy's. But there are some additions. No authority is stated in support of them, but they are cautiously introduced by "it is supposed." The Musalmáns are scandalized at the idea that Moḥammad should ever have worshipped idols, and therefore not only is the passage of Wáqidy omitted in which it is allowed that he had done so, but it is said that Moḥammad reproved the Monk (or Hermit) for swearing by al-Lát and al'ozzá. (Later authors have improved on Ibn Isháq, and assert that Moḥammad refused to swear by these two idols, when required to do so by a merchant). It is no doubt the same spirit of dishonesty which manifests itself in this addition, which induced Ibn Isháq to state that Abú Tálíb returned fast with him to Makkah instead of the words "he sent him back, &c." as he found in the two traditions which he followed. By these means and by omitting in another part of his work the very mention of the deputation of Abrahah of which Baḥyrá was a member, he got over the charges of the Christians against the prophet.



*On the Meteorology of Rampore Bauleah, for the year 1851.—By*  
**J. R. BEDFORD, Esq. Assistant Surgeon, Bengal Army.**

The following reductions are obtained from observations made at Rampore Bauleah, the principal town of Zillah Rajshahye. Newman's standard Barometer and carefully compared Thermometers were employed. Time was determined by observations of the rising and setting sun. The Barometric observations have been reduced to  $32^{\circ}$ .

Rampore Bauleah is in latitude  $24^{\circ} 21' 26''$  N., and longitude  $88^{\circ} 37' 45''$  East, having an elevation of 65.8 feet above the sea level.

The station is bounded on the South by the Ganges—five miles broad in the rains; to the North, East and West by a well cultivated flat country studded with large trees.

The Barometer and Air Thermometer were placed in a small room of a pukka house, open to the air, without being exposed to the breeze. The Pluviometer and Vane were distant from any object likely to interfere with their indications.

The wind's force was noted according to the Admiralty symbols, which necessarily afford an imperfect expression to a land's-man.\*

The "Term observations" are wanting on several occasions during the year, owing to my forced absence from home; and December is altogether excluded for the same cause.

Dr. Buist tells us, in his *Manual of Physical Research for India*, that "at Aden there is a departure from the law," which seems to obtain in nearly all parts of India, the maximum depression for the year occurring, not in January, but in February; the minimum in July instead of June. It is much the highest in December, but makes a plunge down in January to recover itself again in February, "afterwards descending regularly to its minimum." A glance at the accompanying Barometric diagram will show that such a curve did not take place at Rampore Bauleah at either of the periods named.

One remarkable atmospheric disturbance took place during the year, viz. on the 22nd, 23rd and 24th of October, which I was prevented from observing in the consecutive way I could have wished. The lowest Barometric reading noticed on that occasion was 29.586 corrected for temperature at 4 p. m. of 22nd, or .155 below the mean of that hour for the month.



The principal Meteorological characteristic of the year was great heat, combined with a diminished rain-fall. The former appeared rather to depend upon the unsteadiness and small mean force of wind, than upon actually increased temperature. The sensation of heat at night was at times almost unbearable. During the month of September the Thermometer in an open verandah stood on several occasions as high as  $90^{\circ}$  at 1 A. M. The so-called hot winds began to blow from W. and S. W. in April, and continued unsteadily until the end of May. The relative frequency of their direction will be at once seen by observing the number of "days of prevailing winds" for these months contained in the appended "mean observations." Their formation in Rampore Bauleah would seem to be chiefly due to the large sandy churs forming on the fall of the Ganges to South and West, and not to a continuation of those of the Upper Provinces. This however is a subject deserving of further investigation. It is more than probable that the stream of hot air constituting the hot winds of Upper India is bounded by the Rajmahal Hills on the South, and that whatever approximation to them may occur in the Gangetic delta is due to purely local causes. Their notable effect in Rampore Bauleah was to raise the mercury in Black Bulb and Air Thermometers apparently in the direct ratio of their force.

It is not an unimportant element of this climate to determine the mean fall of Thermometer subsequent to North-Westers or heavy falls of rain. My observations are not yet sufficiently full, to claim perfect reliance, but as far as they have gone, the result is  $5^{\circ}$  in a Thermometer placed in open room, and free from influence of reflected heat.

The indications of the Black Bulb Thermometer are so liable to be interfered with by passing clouds or haze, that it becomes very difficult to exhibit a true mean. As the diagram appended to this paper will show, however, they rise to a great altitude in April and May, and possess even a larger proportionate one in October and November when compared with the Mean, or Maximum and Minimum curve of Air Thermometer. Dr. Hooker, in a paper published in the Society's Journal, during his stay in this country, says, "at  $9\frac{1}{2}$  A. M. the Black Bulb Thermometer rose in the sun to  $130^{\circ}$ . The morning observation before 10 or 11 A. M. always gives a higher result than at noon, though the sun's declination is so considerably less, and in the hottest



part of the day it is lower still ( $3\frac{1}{2}$  P. M.  $109^{\circ}$ ), an effect no doubt due to the vapours raised by the sun, and which equally interfere with the Photometer observations."

The observations subsequently recorded and exhibited in the diagram, will not be found to agree with this, as in three months out of five the Maximum reading in sun's rays was obtained at 4 P. M. and the Mean Maximum in two months out of five of that hour. The mean of Black Bulb Thermometer has been in every case computed from observations made under a cloudless sky, or at least one in which no visible barrier interfered with the direct solar rays. Even under these conditions, however, the mercury exhibited great varieties in height—a fact due, I presume, to some passing haze not visible to the eye. It is worthy of being noted that on every occasion on which the sky became obscured with dark heavy storm clouds, the reading of Black Bulb fell to the same level with that of the Thermometer in shade, proving their impenetrability to even the fierce sun of the Tropics.

In the absence of an Anemometer all record of the "wind's force" must be defective. The mean strength for the year tested by the Admiralty scale, would not be considerable. The characteristic storm-cloud consisting of one long roll of cloud, often stretching from one point of the sensible horizon to the other, generally known by the name of North-Wester, by no means invariably come from that quarter. The originating points stood in the following order as regards frequency: 1. North-West; 2. West; 3. South-West; 4. South; 5. South-East. Their rate of movement is deserving of investigation. The wind accompanying them is frequently not sensible, until the anterior part of the storm-cloud has passed the zenith. They are not invariably accompanied by rain. It would be interesting to ascertain the points and modes of origin of these peculiar storm-clouds. Their existence and advent are common in every part of Bengal, but we possess no knowledge of their commencement. Again how far do they continue in their course unbroken? As well as I have been able to trace them from one sensible horizon to the other no change occurs in their formation.

The total rain-fall for the year was only 34.61, and the number of days in which rain fell 56.





Mean observations computed from the Meteorological Register kept at the Civil Assistant Surgeon's Office Rajshaye for the month of January, 1851.

| 1<br>Hours of obser-<br>vation. | 2<br>Barometer re-<br>duced. | 3<br>Ther. in shade. | 4<br>Thermometer in<br>Sun's rays. | 5<br>No. of days of<br>Prevailing Winds. |          |          |        |          |          |       |       | Extreme Barometrical<br>range of the month. | Extreme Thermometri-<br>cal do. of the month. | Extreme do. do. of<br>24 hours. | Mean do. do. of the<br>month. | Max. temperature of<br>month in Sun's rays. | Inches of rain during<br>the month. | No. of days in which<br>rain fell. |
|---------------------------------|------------------------------|----------------------|------------------------------------|------------------------------------------|----------|----------|--------|----------|----------|-------|-------|---------------------------------------------|-----------------------------------------------|---------------------------------|-------------------------------|---------------------------------------------|-------------------------------------|------------------------------------|
|                                 |                              |                      |                                    | North.                                   | N. East. | N. West. | South. | S. East. | S. West. | East. | West. |                                             |                                               |                                 |                               |                                             |                                     |                                    |
| Sunrise.                        | ...                          | 63                   | 0                                  | 5                                        | 0        | 1        | 0      | 0        | 0        | 0     | 4     | 30.112 to<br>29.859                         | 61° to 71°<br>10°                             | 7°                              | 63° to 68°<br>6°              |                                             |                                     |                                    |
| 10 A. M.                        | 30.04                        | 65                   | 0                                  | 3                                        | 0        | 7        | 0      | 0        | 0        | 3     | 5     |                                             |                                               |                                 |                               |                                             |                                     |                                    |
| 4 P. M.                         | 29.93                        | 68                   | 0                                  | 3                                        | 0        | 5        | 0      | 0        | 0        | 0     | 4     |                                             |                                               |                                 |                               |                                             |                                     |                                    |
| Sunset.                         | ...                          | 68                   | 0                                  | 3                                        | 0        | 3        | 0      | 0        | 0        | 0     | 2     |                                             |                                               |                                 |                               |                                             |                                     |                                    |

Term observations, January 21st, 1851.

| Hour. | Barometer re-<br>duced. | Thermometer<br>in shade. | Ther. in Sun's<br>rays. | Direction of<br>Wind. | Force of<br>Wind. | Aspect of<br>Sky. | Remarks. |
|-------|-------------------------|--------------------------|-------------------------|-----------------------|-------------------|-------------------|----------|
| 6     | 30.                     | 66                       | ...                     | 0                     | 0                 | Clear.            |          |
| 8     | 30.03                   | 64                       | ...                     | E.                    | 1                 | 0                 |          |
| 9     | 30.09                   | 65.5                     | ...                     | W.                    | 1                 | c                 |          |
| 10    | 30.08                   | 66.30                    | ...                     | N. W.                 | 1                 | c                 |          |
| 11    | 30.06                   | 68                       | ...                     | N. W.                 | 1                 | c                 |          |
| 12    | 30.02                   | 69                       | ...                     | N. W.                 | 1                 | b                 |          |
| 1     | 30.                     | 70                       | ...                     | N. W.                 | 1                 | b                 |          |
| 2     | 29.98                   | 70                       | ...                     | N. W.                 | 1                 | b                 |          |
| 3     | 29.96                   | 70                       | ...                     | 0                     | 0                 | b                 |          |
| 4     | 29.96                   | 70                       | ...                     | N. W.                 | 1                 | b                 |          |
| 5     | 29.96                   | 70                       | ...                     | 0                     | 0                 | b                 |          |
| 6     | 29.96                   | 69                       | ...                     | 0                     | 0                 | b                 |          |
| 7     | 29.97                   | 69                       | ...                     | W.                    | 1                 | b                 |          |
| 8     | 30.                     | 68                       | ...                     | W.                    | 1                 | b                 |          |
| 9     | 30.02                   | 68                       | ...                     | 0                     | 1                 | b                 |          |
| 10    | 30.02                   | 67                       | ...                     | 0                     | 0                 | 0                 |          |
| 11    | 30.03                   | 67                       | ...                     | W.                    | 1                 | b                 |          |
| 12    | 30.03                   | 67                       | ...                     | 0                     | 0                 | 0                 |          |
| 1     | 30.01                   | 67                       | ...                     | W.                    | 1                 | c                 |          |
| 2     | 30.01                   | 66.50                    | ...                     | W.                    | 2                 | c                 |          |
| 3     | 30.01                   | 66                       | ...                     | 0                     | 0                 | c                 |          |
| 4     | 30.00                   | 66                       | ...                     | 0                     | 0                 | c                 |          |
| 5     | 30.                     | 66                       | ...                     | 0                     | 0                 | c                 |          |
| 6     | 30.03                   | 66.30                    | ...                     | 0                     | 0                 | 0                 |          |





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## On the Meteorology of Rampore Bauleah.

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Mean observations for the month of February, 1851.

| 1<br>Hours of obser-<br>vation. | 2<br>Barometer re-<br>duced. | 3<br>Ther. in shade. | 4<br>Thermometer in<br>Sun's rays. | 5<br>No. of days of<br>Prevailing Winds. |          |          |        |          |          |       |       | Extreme Barometrical<br>range of the month. | Extreme Thermometri-<br>cal do. of the month. | Extreme do. of<br>24 hours. | Mean do. do. of the<br>month. | Max. Temperature of<br>month in Sun's rays. | Inches of rain during<br>the month. | No. of days in which<br>rain fell. |
|---------------------------------|------------------------------|----------------------|------------------------------------|------------------------------------------|----------|----------|--------|----------|----------|-------|-------|---------------------------------------------|-----------------------------------------------|-----------------------------|-------------------------------|---------------------------------------------|-------------------------------------|------------------------------------|
|                                 |                              |                      |                                    | North.                                   | N. East. | N. West. | South. | S. East. | S. West. | East. | West. |                                             |                                               |                             |                               |                                             |                                     |                                    |
| Sunrise.                        | ...                          | 69                   | ...                                | 4                                        | ...      | 1        | ...    | ...      | ...      | ...   | 4     | 30.072 to<br>29.661                         | 19°                                           | 10°                         | 69° to 75°<br>7°              |                                             | 1.30                                | 3                                  |
| 10 A. M.                        | 29.918                       | 70                   | ...                                | 5                                        | ...      | ...      | ...    | ...      | ...      | 2     | 5     |                                             |                                               |                             |                               |                                             |                                     |                                    |
| 4 P. M.                         | 29.791                       | 75                   | ...                                | 2                                        | ...      | ...      | ...    | 1        | ...      | ...   | 7     |                                             |                                               |                             |                               |                                             |                                     |                                    |
| Sunset.                         | ...                          | 74                   | ...                                | ...                                      | ...      | ...      | ...    | ...      | ...      | ...   | ...   |                                             |                                               |                             |                               |                                             |                                     |                                    |

Term observations, February 21st, 1851.

| Hour.   | Barometer re-<br>duced. | Thermometer<br>in shade. | Ther. in Sun's<br>rays. | Direction of<br>Wind. | Force of<br>Wind. | Aspect of<br>Sky. | Remarks. |
|---------|-------------------------|--------------------------|-------------------------|-----------------------|-------------------|-------------------|----------|
| 6 A. M. | 0                       | 0                        | ...                     | 0                     | 0                 | 0                 |          |
| 7       | 29.93                   | 68                       | ...                     | N. W.                 | 1                 | b                 |          |
| 8       | 29.97                   | 68                       | ...                     | W.                    | 1                 | b                 |          |
| 9       | 29.99                   | 69                       | ...                     | W.                    | 1                 | b                 |          |
| 10      | 30.                     | 71                       | ...                     | W.                    | 3                 | b                 |          |
| 11      | 29.97                   | 72                       | ...                     | W.                    | 3                 | b                 |          |
| 12      | 29.95                   | 72½                      | ...                     | W.                    | 3                 | b                 |          |
| 1       | 29.91                   | 74                       | ...                     | W.                    | 3                 | b                 |          |
| 2       | 29.89                   | 75                       | ...                     | W.                    | 3                 | b                 |          |
| 3       | 29.87                   | 75                       | ...                     | 0                     | 0                 | b                 |          |
| 4       | 29.87                   | 76                       | ...                     | 0                     | 0                 | b                 |          |
| 5       | 29.87                   | 75½                      | ...                     | 0                     | 0                 | b                 |          |
| 6       | 29.88                   | 74                       | ...                     | 0                     | 0                 | b                 |          |
| 7       | 29.90                   | 73½                      | ...                     | 0                     | 0                 | b                 |          |
| 8       | 29.93                   | 73                       | ...                     | S.                    | 1                 | b                 |          |
| 9       | 29.94                   | 73                       | ...                     | S.                    | 1                 | b                 |          |
| 10      | 29.94                   | 72½                      | ...                     | 0                     | 0                 | 0                 |          |
| 11      | 29.93                   | 72                       | ...                     | 0                     | 0                 | 0                 |          |
| 12      | 29.89                   | 70½                      | ...                     | 0                     | 0                 | 0                 |          |
| 1       | 29.92                   | 69½                      | ...                     | 0                     | 0                 | 0                 |          |
| 2       | 29.90                   | 69                       | ...                     | 0                     | 0                 | 0                 |          |
| 3       | 29.83                   | 69                       | ...                     | 0                     | 0                 | 0                 |          |
| 4       | 29.87                   | 69                       | ...                     | 0                     | 0                 | 0                 |          |
| 5       | 29.87                   | 68                       | ...                     | 0                     | 0                 | 0                 |          |
| 6       | 0                       | 0                        | ...                     | 0                     | 0                 | 0                 |          |









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## On the Meteorology of Rampore Bauleah.

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## Mean observations for the Month of April, 1851.

| 1                          | 2                       | 3               | 4                             | 5                                   |          |          |        |          |          |       |       |                                             |                                               |                                 |                               |                                             |                                     |                                    |
|----------------------------|-------------------------|-----------------|-------------------------------|-------------------------------------|----------|----------|--------|----------|----------|-------|-------|---------------------------------------------|-----------------------------------------------|---------------------------------|-------------------------------|---------------------------------------------|-------------------------------------|------------------------------------|
| Hours of obser-<br>vation. | Barometer re-<br>duced. | Ther. in shade. | Thermometer in<br>Sun's rays. | No. of days of<br>prevailing Winds. |          |          |        |          |          |       |       | Extreme Barometrical<br>range of the month. | Extreme Thermometri-<br>cal do. of the month. | Extreme do. do. of<br>24 hours. | Mean do. do. of the<br>month. | Max. Temperature of<br>month in Sun's rays. | Inches of rain during<br>the month. | No. of days in which<br>rain fell. |
|                            |                         |                 |                               | North.                              | N. East. | N. West. | South. | S. East. | S. West. | East. | West. |                                             |                                               |                                 |                               |                                             |                                     |                                    |
| Sunrise.                   | ...                     | 81              | 0                             | 0                                   | 1        | 0        | 5      | 1        | 0        | 5     | 0     | 29.917 to                                   | 76° to 95°                                    |                                 |                               |                                             |                                     |                                    |
| 10 A. M.                   | 29.734                  | 85              | 112                           | 0                                   | 1        | 0        | 11     | 2        | 3        | 5     | 2     | 29.45                                       | 20°                                           | 12°                             | 9°                            | 123°                                        | 1.10                                |                                    |
| 4 P. M.                    | 29.622                  | 89              | 106                           | 0                                   | 1        | 1        | 5      | 0        | 0        | 6     | 5     |                                             |                                               |                                 |                               |                                             | 3                                   |                                    |
| Sunset.                    | ...                     | 88              | 0                             | 0                                   | 0        | 0        | 2      | 0        | 0        | 4     | 0     |                                             |                                               |                                 |                               |                                             |                                     |                                    |

## Term observations, April 21st, 1851.

| Hour.  | Barometer reduced. | Ther. in shade. | Ther. in Sun's rays. | Direction of Wind. | Force of Wind. | Aspect of Sky. | Remarks.                                   |
|--------|--------------------|-----------------|----------------------|--------------------|----------------|----------------|--------------------------------------------|
| 6 A.M. | 29.678             | 80              | 75                   | 0                  | 0              | g              |                                            |
| 7      | 29.694             | 81              | 103                  | 0                  | 0              | b              |                                            |
| 8      | 29.709             | 82.5            | 110                  | 0                  | 0              | b              |                                            |
| 9      | 29.711             | 84              | 112                  | S.                 | 1              | b              |                                            |
| 15     | 29.715             | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 30     | 29.708             | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 45     | 29.701             | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 10     | 29.699             | 85              | 112                  | S.                 | 2              | b              |                                            |
| 11     | 29.686             | 86              | 114                  | S.                 | 2              | b              |                                            |
| 12     | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 1      | 29.632             | 88              | 102                  | S.                 | 2              | c              |                                            |
| 2      | 29.584             | 88.75           | 120                  | S.                 | 1              | b              |                                            |
| 3      | 29.553             | 90              | 112                  | E.                 | 2              | c              |                                            |
| 4      | 29.522             | 90              | 111                  | E.                 | 2              | b              |                                            |
| 15     | 29.513             | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 30     | 29.511             | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 45     | 29.509             | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 5      | 29.507             | 90              | 102                  | S.                 | 1              | b              |                                            |
| 6      | 29.507             | 89              | 90                   | S.                 | 1              | b              |                                            |
| 7      | 29.593             | 86              | 0                    | N. W.              | 2              | g. t. l.       | Storm from N. W. blowing with No. 8 force. |
| 8      | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 9      | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 15     | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 30     | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 45     | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 10     | 29.607             | 72              | 0                    | E.                 | 3              | b              |                                            |
| 11     | 29.609             | 72              | 0                    | E.                 | 3              | b              |                                            |
| 12     | 29.617             | 72              | 0                    | E.                 | 2              | b              |                                            |
| 1      | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 2      | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |
| 3      | 0                  | 0               | 0                    | 0                  | 0              | 0              |                                            |





*April 2nd.*—A strong breeze sprung up at 10 last night from N. E., continuing till this morning. 5th. Breeze of 4 force from E. from 8 P. M. until 10 P. M. 7th. Wind No. 3 from E. from 9 P. M. until 12 midnight. 9th. Blowing in gusts between 12 and 4 P. M. 12th. Wind hot all day. 14th. At 2 P. M. very gloomy. At 5 P. M. cleared off without rain. At 6 P. M. a strong wind of No. 8 force from 8 till 7½ P. M. 16th. At 5 P. M. a strong breeze of No. 5 force blew from E. until midnight. 17th. 2 P. M. became cloudy. At 3 rain and hail for 5 minutes, each hailstone spherical or discoid, presenting in centre small opaque point. 3 h. 5 m. rain ceased; wind N. E. blowing strong until midnight. 18th. A breeze of No. 5 force from 6 P. M. until 9 P. M. 19th. A wind of No. 8 force from S. from 6 to 8 P. M. Much thunder and lightning till 10 P. M. 20th. Blowing No. 8 from 6 to 10 P. M. S. 28th. A North-wester at 6 P. M.

*Mean observations for the month of May, 1851.*

| 1<br>Hours of obser-<br>vation. | 2<br>Barometer re-<br>duced. | 3<br>Ther. in shade. | 4<br>Thermometer in<br>Sun's rays. | 5<br>No. of days of<br>prevailing Winds. |          |          |        |          |          |       |       | Extreme Barometrical<br>range of the month. | Extreme Thermometri-<br>cal do. of the month. | Extreme do. do. of<br>24 hours. | Mean do. do. of the<br>month. | Max. temperature of<br>month in Sun's rays. | Inches of rain during<br>the month. | No. of days in which<br>rain fell. |
|---------------------------------|------------------------------|----------------------|------------------------------------|------------------------------------------|----------|----------|--------|----------|----------|-------|-------|---------------------------------------------|-----------------------------------------------|---------------------------------|-------------------------------|---------------------------------------------|-------------------------------------|------------------------------------|
|                                 |                              |                      |                                    | North.                                   | N. East. | N. West. | South. | S. East. | S. West. | East. | West. |                                             |                                               |                                 |                               |                                             |                                     |                                    |
| Sunrise.                        | ...                          | 87                   | 0                                  | 0                                        | 1        | 0        | 0      | 0        | 0        | 0     | 1     | 29.750 to<br>29.331                         | 87° to 101°<br>15°                            | 11°                             | 7                             | 130°                                        | 1.60                                | 2                                  |
| 10 A. M.                        | 29.609                       | 89                   | 110                                | 0                                        | 0        | 0        | 1      | 6        | 6        | 0     | 2     |                                             |                                               |                                 |                               |                                             |                                     |                                    |
| 4 P. M.                         | 29.483                       | 93                   | 120                                | 0                                        | 0        | 0        | 6      | 2        | 3        | 0     | 0     |                                             |                                               |                                 |                               |                                             |                                     |                                    |
| Sunset.                         | ...                          | 93                   | 0                                  | 0                                        | 0        | 0        | 2      | 2        | 0        | 1     | 0     |                                             |                                               |                                 |                               |                                             |                                     |                                    |

5th. At 8 P. M. strong S. wind of No. 4 force. 9th. Hot wind during day; cool at night. 10. Ditto. 11th. Hot wind all day. From 7 till 10 P. M. quite still. 12th. Hot wind during day. From 5 till 10 P. M. still. 13th. Hot wind. 14th. Ditto. 15th. Ditto. 16th. Storm with thunder from W. 2 to 3 P. M.; no rain. 18th. Strong breeze from S. E. at 9 P. M. all night. 19th. Strong breeze from E. at 6 P. M. fresh and cool. 20th. No hot wind. Storm at 4 P. M.



*General character of month.*

The heat experienced has been unusually great and the commencement of the rain much delayed. Up to the 21st the hot winds blew steadily always from the S. W. and W. and with considerable strength as shown by the numerical force. Many of the evenings were perfectly still, the breeze rising at 8 or 9 p. m. and blowing coolly all night, reducing the Thermometric reading by midnight to 8.4. The hot winds at Bauleah are principally due to the large sandy churs in the vicinity to S. and W. of station. *Barometer*; on the 10th 12th 14th 16th 25th. The reading was lower at sunset than at 4 p. m. *Thermometer* on the 10th Inst. It reached the unprecedentedly high reading of 101 in the shade, which seems to have been due to the force of the hot wind which is marked 6 on that day. It will be seen that the reading in sun's rays was by no means high on the same date, amounting only to 116.°

*Mean observations for the month of June, 1851.*

| 1                                          | 2                              | 3                    | 4                             | 5                                   |                  |                  |                  |                   |                  |                  |                  | Extreme Barometrical<br>range of the month. | Extreme Thermometrical<br>do. of the month. | Extreme do. of<br>24 hours. | Mean do. of the<br>month. | Max. temperature of<br>month in Sun's rays. | Inches of rain during<br>the month. | No. of days in which<br>rain fell. |
|--------------------------------------------|--------------------------------|----------------------|-------------------------------|-------------------------------------|------------------|------------------|------------------|-------------------|------------------|------------------|------------------|---------------------------------------------|---------------------------------------------|-----------------------------|---------------------------|---------------------------------------------|-------------------------------------|------------------------------------|
| Hours of obser-<br>vation.                 | Barometer re-<br>duced.        | Ther. in shade.      | Thermometer in<br>Sun's rays. | No. of days of<br>prevailing Winds. |                  |                  |                  |                   |                  |                  |                  |                                             |                                             |                             |                           |                                             |                                     |                                    |
|                                            |                                |                      |                               | North.                              | N. East.         | N. West.         | South.           | S. East.          | S. West.         | East.            | West.            |                                             |                                             |                             |                           |                                             |                                     |                                    |
| Sunrise.<br>10 A. M.<br>4 P. M.<br>Sunset. | ...<br>29.518<br>29.434<br>... | 83<br>86<br>88<br>88 | 0<br>106<br>108<br>0          | 0<br>0<br>0<br>0                    | 0<br>1<br>0<br>0 | 0<br>0<br>0<br>0 | 1<br>6<br>3<br>2 | 6<br>8<br>11<br>9 | 0<br>4<br>2<br>1 | 1<br>3<br>6<br>3 | 0<br>0<br>1<br>0 | 29.688 to<br>29.283                         | 80° to 93°<br>14°                           | 10°                         | 5°                        | 111°                                        | 6.88                                | 11                                 |

Storms from the N. W. occurred on the 6th and 7th and from S. W. on the 16th. The close of the month was marked by strong breezes from S. E. and S.





## Mean observations for the month of July, 1851.

| 1                                          | 2                              | 3                    | 4                             | 5                                   |                  |                  |                  |                     |                  |                  |                                             |                                               |                                |                               |                                             |                                     |                                    |       |
|--------------------------------------------|--------------------------------|----------------------|-------------------------------|-------------------------------------|------------------|------------------|------------------|---------------------|------------------|------------------|---------------------------------------------|-----------------------------------------------|--------------------------------|-------------------------------|---------------------------------------------|-------------------------------------|------------------------------------|-------|
| Hours of obser-<br>vation.                 | Barometer re-<br>duced.        | Ther. in shade.      | Thermometer in<br>Sun's rays. | No. of days of<br>prevailing Winds. |                  |                  |                  |                     |                  |                  | Extreme Barometrical<br>range of the month. | Extreme Thermometri-<br>cal do. of the month. | Extreme do. do of<br>24 hours. | Mean do. do. of the<br>month. | Max. temperature of<br>month in Sun's rays. | Inches of rain during<br>the month. | No. of days in which<br>rain fell. |       |
|                                            |                                |                      |                               | North.                              | N. East.         | N. West.         | South.           | S. East.            | S. West.         | East.            |                                             |                                               |                                |                               |                                             |                                     |                                    | West. |
| Sunrise.<br>10 A. M.<br>4 P. M.<br>Sunset. | ...<br>29.577<br>29.478<br>... | 83<br>84<br>87<br>86 | Constant<br>clouds.           | 0<br>0<br>0<br>0                    | 0<br>0<br>0<br>0 | 0<br>0<br>0<br>0 | 0<br>4<br>2<br>0 | 4<br>19<br>16<br>15 | 3<br>2<br>2<br>1 | 0<br>1<br>1<br>1 | 0<br>0<br>0<br>0                            | 29.705 to<br>29.382                           | 80° to 92°<br>13°              | 7°                            | 5°                                          | 0                                   | 11.56                              | 17    |

## Term observations, July 21st, 1851.

| Hour.  | Barometer reduced. | Ther. in shade. | Ther. in Sun's rays. | Direction of Wind. | Force of Wind. | Aspect of Sky. | Remarks. |
|--------|--------------------|-----------------|----------------------|--------------------|----------------|----------------|----------|
| 6 A.M. | 0                  | 0               | Constant clouds.     | 0                  | 0              | 0              |          |
| 7      | 29.6               | 83              |                      | S. W.              | 2              | 2              |          |
| 8      | 29.619             | 83              |                      | S. W.              | 2              | 2              |          |
| 9      | 29.621             | 83              |                      | S. W.              | 1              | 2              |          |
| 15     | 29.613             | 0               |                      | 0                  | 0              | 0              |          |
| 30     | 29.607             | 0               |                      | 0                  | 0              | 0              |          |
| 45     | 29.604             | 0               |                      | 0                  | 0              | 0              |          |
| 10     | 29.602             | 84              |                      | S.                 | 1              | 2              |          |
| 11     | 29.59              | 84              |                      | S. W.              | 1              | 2              |          |
| 12     | 29.58              | 85              |                      | S.                 | 1              | 0              |          |
| 1      | 29.559             | 85              |                      | S.                 | 1              | 2              |          |
| 2      | 29.531             | 85.5            |                      | 0                  | 0              | 2              |          |
| 3      | 0                  | 0               |                      | 0                  | 0              | 0              |          |
| 4      | 29.501             | 85.25           |                      | S. E.              | 3              | 2              |          |
| 15     | 29.495             | 0               |                      | 0                  | 0              | 0              |          |
| 30     | 29.490             | 0               |                      | 0                  | 0              | 0              |          |
| 45     | 29.494             | 0               |                      | 0                  | 0              | 0              |          |
| 5      | 29.497             | 84              |                      | S. E.              | 3              | 2              |          |
| 6      | 29.508             | 83.5            |                      | S. E.              | 1              | 2              |          |
| 7      | 29.54              | 83              |                      | S. E.              | 3              | 2              |          |
| 8      | 0                  | 0               |                      | 0                  | 0              | 0              |          |
| 9      | 29.563             | 83              |                      | S. E.              | 2              | 2              |          |
| 15     | 29.563             | 0               |                      | 0                  | 0              | 0              |          |
| 30     | 29.564             | 0               |                      | 0                  | 0              | 0              |          |
| 45     | 29.566             | 0               |                      | 0                  | 0              | 0              |          |
| 10     | 29.568             | 83              |                      | S. E.              | 1              | 2              |          |
| 11     | 29.561             | 82              |                      | S. E.              | 2              | 2              |          |
| 12     | 29.565             | 82              |                      | 0                  | 0              | 0              |          |
| 1      | 0                  | 0               |                      | 0                  | 0              | 0              |          |
| 2      | 0                  | 0               |                      | 0                  | 0              | 0              |          |
| 3      | 0                  | 0               |                      | 0                  | 0              | 0              |          |





1852.]

*On the Meteorology of Rampore Bauleah.*

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*Mean observations for the month of August, 1851.*

| 1                     | 2                  | 3               | 4                          | 5                                |          |          |        |          |          |       |       | Extreme Barometrical range of the month. | Extreme Thermometrical do. of the month. | Extreme do. of 24 hours. | Mean do. do. of the month. | Max. temperature of month in Sun's rays. | Inches of rain during the month. | No. of days in which rain fell. |
|-----------------------|--------------------|-----------------|----------------------------|----------------------------------|----------|----------|--------|----------|----------|-------|-------|------------------------------------------|------------------------------------------|--------------------------|----------------------------|------------------------------------------|----------------------------------|---------------------------------|
| Hours of observation. | Barometer reduced. | Ther. in shade. | Thermometer in Sun's rays. | No. of days of prevailing Winds. |          |          |        |          |          |       |       |                                          |                                          |                          |                            |                                          |                                  |                                 |
|                       |                    |                 |                            | North.                           | N. East. | N. West. | South. | S. East. | S. West. | East. | West. |                                          |                                          |                          |                            |                                          |                                  |                                 |
| Sunrise.              | ...                | 84              | 0                          | 0                                | 0        | 0        | 0      | 0        | 0        | 0     | 0     | 29.740 to                                | 81° to 92°                               | 7°                       | 5°                         | 0                                        | 4.95                             | 11                              |
| 10 A. M.              | 29.576             | 86              | 0                          | 0                                | 0        | 0        | 7      | 10       | 2        | 0     | 0     | 29.391                                   | 12°                                      |                          |                            |                                          |                                  |                                 |
| 4 P. M.               | 29.478             | 88              | 0                          | 0                                | 0        | 0        | 5      | 13       | 2        | 0     | 0     |                                          |                                          |                          |                            |                                          |                                  |                                 |
| Sunset.               | ...                | 88              | 0                          | 0                                | 0        | 0        | 3      | 4        | 0        | 0     | 0     |                                          |                                          |                          |                            |                                          |                                  |                                 |

*Term observations, August 21st, 1851.*

| Hour.  | Barometer reduced. | Ther. in shade. | Ther. in Sun's rays. | Direction of Wind. | Force of Wind. | Aspect of Sky. | Remarks. |
|--------|--------------------|-----------------|----------------------|--------------------|----------------|----------------|----------|
| 6 A.M. | 0                  | 0               | ...                  | 0                  | 0              | 0              |          |
| 7      | 29.661             | 82              | ...                  | S. W.              | 2              | c              |          |
| 8      | 29.681             | 82.25           | ...                  | S. W.              | 2              | c              |          |
| 9      | 29.692             | 83              | ...                  | S. W.              | 3              | c              |          |
| 15     | 29.694             | 0               | ...                  | 0                  | 0              | 0              |          |
| 30     | 29.690             | 0               | ...                  | 0                  | 0              | 0              |          |
| 45     | 29.688             | 0               | ...                  | 0                  | 0              | 0              |          |
| 10     | 29.685             | 84              | ...                  | S. W.              | 4              | c              |          |
| 11     | 29.671             | 84.75           | ...                  | S. W.              | 2              | c              |          |
| 12     | 29.653             | 84.50           | ...                  | S. W.              | 1              | c. b.          |          |
| 1 P.M. | 0                  | 0               | ...                  | 0                  | 0              | 0              |          |
| 2      | 0                  | 0               | ...                  | 0                  | 0              | 0              |          |
| 3      | 29.593             | 84              | ...                  | 0                  | 0              | 0              |          |
| 4      | 29.577             | 84              | ...                  | S. W.              | 1              | c. g.          |          |
| 15     | 29.577             | 0               | ...                  | 0                  | 0              | 0              |          |
| 30     | 0                  | 0               | ...                  | 0                  | 0              | 0              |          |
| 45     | 29.576             | 0               | ...                  | 0                  | 0              | 0              |          |
| 5      | 29.577             | 83.7            | ...                  | S.                 | 1              | c              |          |
| 6      | 29.577             | 83.5            | ...                  | S.                 | 1              | c              |          |
| 7      | 29.619             | 83              | ...                  | 0                  | 0              | 0              |          |
| 8      | 29.634             | 83              | ...                  | 0                  | 0              | 0              |          |
| 9      | 29.662             | 83              | ...                  | 0                  | 0              | 0              |          |
| 15     | 29.667             | 0               | ...                  | 0                  | 0              | 0              |          |
| 30     | 29.667             | 0               | ...                  | 0                  | 0              | 0              |          |
| 45     | 29.665             | 0               | ...                  | 0                  | 0              | 0              |          |
| 10     | 29.665             | 83              | ...                  | 0                  | 0              | 0              |          |
| 11     | 29.666             | 83              | ...                  | 0                  | 0              | 0              |          |
| 12     | 29.664             | 83              | ...                  | 0                  | 0              | 0              |          |
| 1      | 0                  | 0               | ...                  | 0                  | 0              | 0              |          |
| 2      | 0                  | 0               | ...                  | 0                  | 0              | 0              |          |
| 3      | 0                  | 0               | ...                  | 0                  | 0              | 0              |          |









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## On the Meteorology of Rampore Bauleah.

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Mean observations for the month of November, 1851.

| 1                     | 2                  | 3               | 4                          | 5                                |          |          |        |          |          |       |       | Extreme Barometrical range of the month. | Extreme Thermometrical do. of the month. | Extreme do. do. of 24 hours. | Mean do. do. of the month. | Max. temperature of month in Sun's rays. | Inches of rain during the month. | No. of days in which rain fell. |
|-----------------------|--------------------|-----------------|----------------------------|----------------------------------|----------|----------|--------|----------|----------|-------|-------|------------------------------------------|------------------------------------------|------------------------------|----------------------------|------------------------------------------|----------------------------------|---------------------------------|
| Hours of observation. | Barometer reduced. | Ther. in shade. | Thermometer in Sun's rays. | No. of days of prevailing Winds. |          |          |        |          |          |       |       |                                          |                                          |                              |                            |                                          |                                  |                                 |
|                       |                    |                 |                            | North.                           | N. East. | N. West. | South. | S. East. | S. West. | East. | West. |                                          |                                          |                              |                            |                                          |                                  |                                 |
| Sunrise.              | ...                | 62              | 0                          | 0                                | 0        | 0        | 0      | 0        | 0        | 0     | 0     | 30.024 to                                | 56 to 81                                 |                              |                            |                                          |                                  |                                 |
| 10 A. M.              | 29.932             | 75              | 104                        | 4                                | 1        | 6        | 0      | 0        | 1        | 0     | 3     | 29.767                                   | 26°                                      | 23°                          | 16                         | 114                                      | .17                              | 2                               |
| 4 P. M.               | 29.824             | 77              | 101                        | 2                                | 0        | 8        | 0      | 0        | 1        | 0     | 1     |                                          |                                          |                              |                            |                                          |                                  |                                 |
| Sunset.               | ...                | 76              | 0                          | 0                                | 0        | 0        | 0      | 0        | 0        | 0     | 0     |                                          |                                          |                              |                            |                                          |                                  |                                 |

Term observations, November 21st, 1851.

| Hour.  | Barometer reduced. | Ther. in shade. | Ther. in Sun's rays. | Direction of Wind. | Force of Wind. | Aspect of Sky. | Remarks. |
|--------|--------------------|-----------------|----------------------|--------------------|----------------|----------------|----------|
| 6 A.M. | 0                  | 0               | 0                    | 0                  | 0              | 0              |          |
| 7      | 29.903             | 69              | 74                   | N. W.              | 1              | b              |          |
| 8      | 29.908             | 70              | 96                   | N. W.              | 1              | b              |          |
| 9      | 29.926             | 71              | 99                   | N. W.              | 1              | b              |          |
| 15     | 29.932             | 0               | 0                    | 0                  | 0              | 0              |          |
| 30     | 29.928             | 0               | 0                    | 0                  | 0              | 0              |          |
| 45     | 29.928             | 0               | 0                    | 0                  | 0              | 0              |          |
| 10     | 29.922             | 73              | 102                  | N. W.              | 1              | b              |          |
| 11     | 29.909             | 74              | 103                  | N. W.              | 2              | b              |          |
| 12     | 29.866             | 75              | 114                  | N. W.              | 2              | b              |          |
| 1      | 29.836             | 75.5            | 106                  | N. W.              | 1              | b c            |          |
| 2      | 29.813             | 76              | 116                  | N. W.              | 1              | b c            |          |
| 3      | 29.797             | 76              | 96                   | W.                 | 3              | b c            |          |
| 4      | 29.795             | 76              | 86                   | W.                 | 2              | b c            |          |
| 15     | 29.795             | 0               | 0                    | 0                  | 0              | 0              |          |
| 30     | 29.795             | 0               | 0                    | 0                  | 0              | 0              |          |
| 45     | 29.795             | 0               | 0                    | 0                  | 0              | 0              |          |
| 5      | 29.797             | 76              | 77                   | 0                  | 0              | 0              |          |
| 6      | 29.811             | 74              | 0                    | 0                  | 0              | 0              |          |
| 7      | 29.829             | 74              | 0                    | 0                  | 0              | 0              |          |
| 8      | 29.849             | 73              | 0                    | 0                  | 0              | 0              |          |
| 9      | 29.854             | 73              | 0                    | 0                  | 0              | 0              |          |
| 15     | 29.854             | 0               | 0                    | 0                  | 0              | 0              |          |
| 30     | 29.854             | 0               | 0                    | 0                  | 0              | 0              |          |
| 45     | 29.862             | 0               | 0                    | 0                  | 0              | 0              |          |
| 10     | 29.862             | 73              | 0                    | 0                  | 0              | 0              |          |
| 15     | 29.862             | 0               | 0                    | 0                  | 0              | 0              |          |
| 30     | 29.862             | 0               | 0                    | 0                  | 0              | 0              |          |
| 45     | 29.856             | 0               | 0                    | 0                  | 0              | 0              |          |
| 11     | 29.854             | 73              | 0                    | 0                  | 0              | 0              |          |
| 12     | 29.854             | 73              | 0                    | 0                  | 0              | 0              |          |



*Note on some Sculptures found in the district of Peshawar.*— By  
E. C. BAYLEY, Esq. B. C. S.

The sculptures of which the accompanying sketches are representations were brought from Jamál Giri in the Eusofzye pergunnah of the Peshawar district.

This place is distant about thirty miles from Peshawar, and by it the road into the Eusofzye country from the Swát valley lies.

A view of the place and a ground plan of the building with a rough sketch of it, are forwarded also (vide Plate XXV.): for these I am indebted to Lieut. Maisten, H. A.

The ruins were originally noticed by Lieut. Lumsden of the Guide Corps, and by him they were pointed out to Lieut. Stokes of the Horse Artillery.

The sculptures were collected by these two officers, and by their liberality came into my possession.

A few more specimens have also been most kindly placed at my disposal by Dr. Kemp of the Medical Service; but these latter I have not yet received, and do not know when I shall be able to get them. I do not therefore longer delay the preparation of this paper; but will, if necessary, supply a further notice when they reach me.

From the plan it will be perceived that the building was twelve-sided externally, and contained an inner circular enclosure.

In each side of the outer enclosure is an opening; but one only is furnished with a flight of steps, and this alone appears to have been used as an entrance.

It is hardly possible to offer any conjecture as to the purposes to which the building was originally applied.

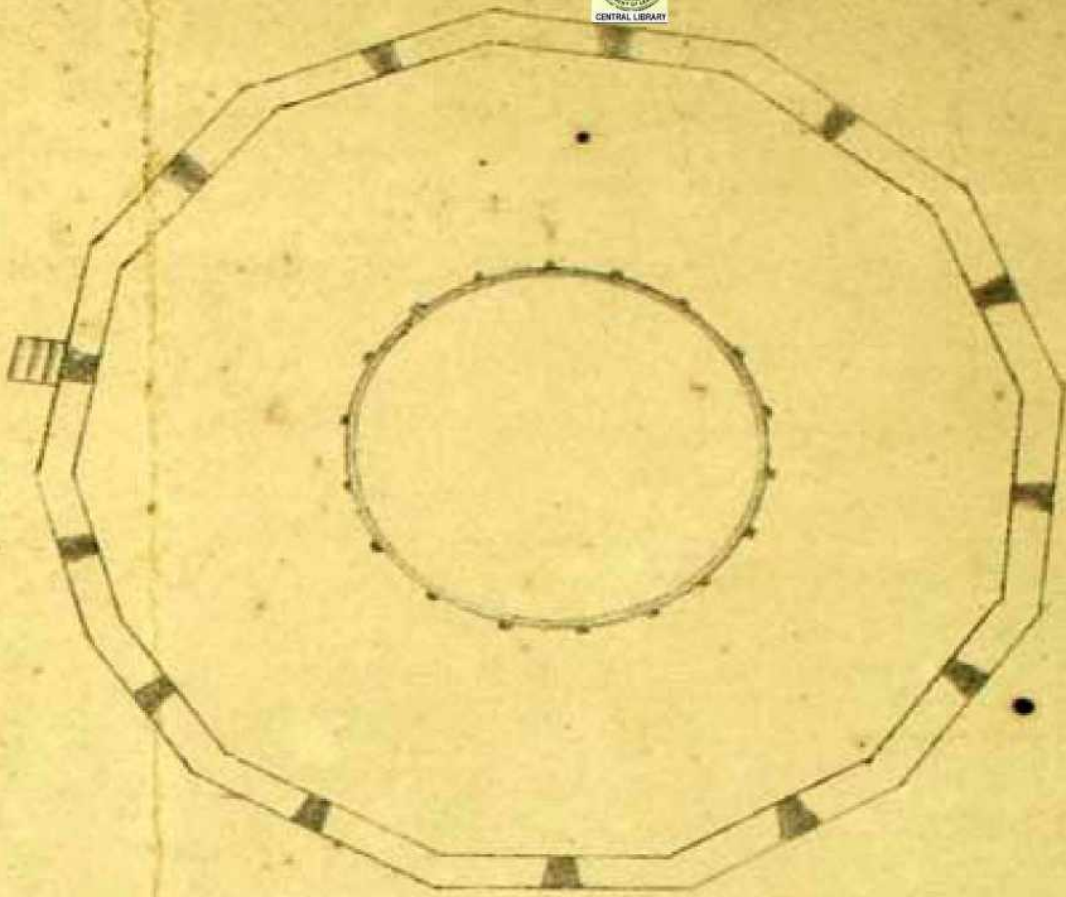
Lieut. Stokes, who has had the opportunity of examining several "topes," declares it to be of a widely different nature.

All that can be safely affirmed is that the character of the sculptures leads to the conclusion that it was an edifice dedicated to religious purposes.

Passing therefore to the sculptures I shall offer a few remarks on each.

Fig. 1 (Plate XXVI.)—Represents apparently a man in the attitude of teaching or exhortation; the singularly mild countenance, the top-knot of twisted hair, the elongated lobes of the ears, seem to denote that it is









Front of the Pedestal of Fig: 2.

*nearly the actual size .*

*T. Black, Architect & Painter.*











the image of Sákya Siñha, or at least some Buddhist saint. The hands and feet are unfortunately broken off.

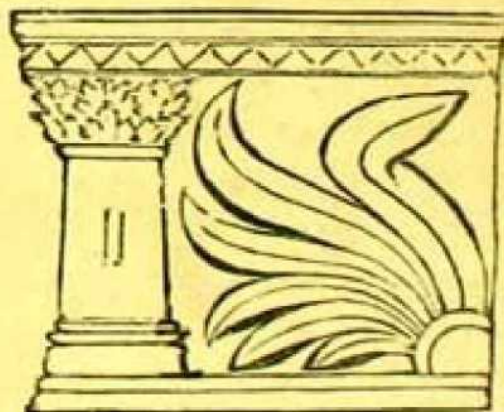
Fig. 2 (Plate XXVII.)—Resembles the above, but is more perfect ; it has remarkably well executed hands and feet on a pedestal which bears an unmistakeable fire-altar, flanked on each side by pilasters of a style which I shall presently notice. (Plate XLI.)

But the most remarkable fact connected with this figure is, that despite its Buddhist characteristics, there is on the forehead a distinct “tilak” or caste mark !

Fig. 3 (Plate XXVIII.)—Is that of a man with moustache, flowing dhoti and sandalled feet ; over the neck and shoulders are suspended what are apparently amulets. On the forehead is the caste mark ; the hair is loose and flows over the shoulders, but in front is apparently bound up with a string of beads or some such ornament, which I think passes over the top-knot, and depresses it into two portions in the middle, but as there is a slight fracture here I am not certain.

The lobe of the ears is also elongated, which may perhaps mark the figure as the work of a Buddhist artist ; otherwise there is no Buddhistical character attaching to it.\*

On the pedestal of this figure and on the sides of that of the preceding one are very elegant scrolls, but of differing patterns.



*Side of the Pedestal shewing the peculiar scroll.*

Fig. 4 (Plate XXIX.)—Is a pilaster of design so evidently Grecian as to place beyond doubt the date of these sculptures as subsequent to Alexander's invasion.

\* The right ear is pierced by a large earring, so that the lobe is in reality not so much elongated as it appears, still it is longer than is natural. The left ear is unfortunately fractured at the bottom.



The capital is not Corinthian, though approaching more closely to that than to any other order of architecture; it wants the volutes, but the foliage is disposed just as in the Corinthian style.

Bearing in mind, therefore, that the Choragic monument of Lysicrates, the earliest example of a pure Corinthian building, was not reached till a short time after Alexander's departure from Greece, it may be considered that some such fashion of architecture as that of the pilaster now figured would be the latest with which the Greeks of Alexander's army would be acquainted—a fashion closely approaching, but not quite attaining, the perfection of Corinthian elegance.

On the shaft of the pilaster is sculptured a very graceful female figure. The hair apparently done up in a top-knot as in figures 1 and 2.

Fig. 5. Plate XXX.—This is a pillar apparently intended to represent one of the same style as above, but of rude execution. Similar pilasters are represented on the pedestal of figure 2, and occur also in figure 7.

Fig. 6. Plate XXXI.—This sculpture is unfortunately much mutilated, and to all appearance purposely.

It represents a group of several figures, of which the chief partakes of much of the character of figures 1 and 2. It has had a "halo" or "nimbus" sculptured round its head (which appears also to have been the case with those figures); the drapery is similarly arranged; the attitude is nearly identical, apparently denoting the utterance of some authoritative or hortatory sentence.

The whole design is peculiarly bold and easy. Immediately on the right hand of the chief figure is a criminal or captive nearly naked; to the right of this again another figure is drawing a species of straight sword as if to put the captive to death.

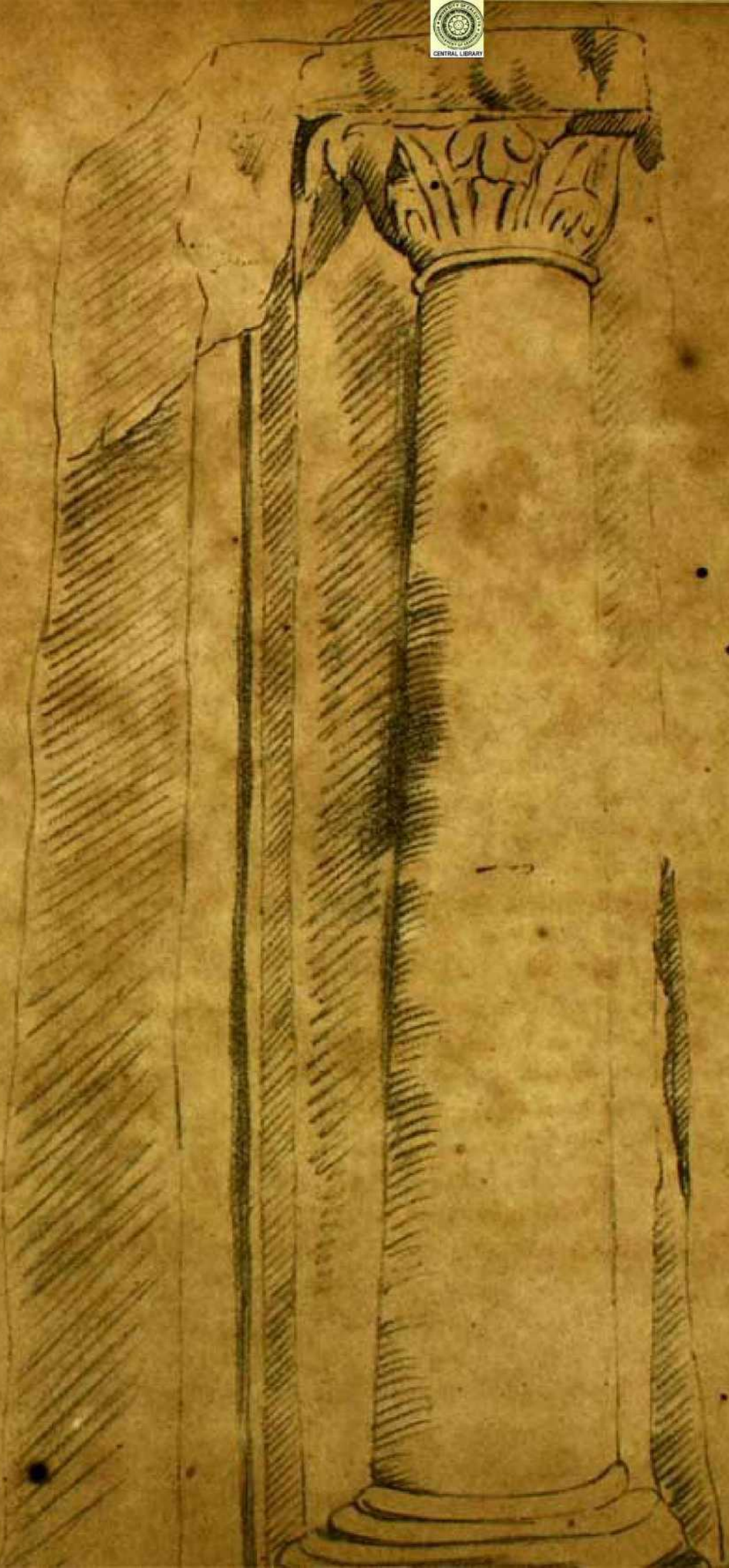
Above him is a mutilated figure, also apparently in the act to strike with a weapon which looks like a bill-hook.

To these figures succeeds a woman evidently in the attitude of listening. Above her head is an attempt to delineate the foliage of a tree, apparently some species of ficus.\* To the left of the principal personage is an attendant waving a chouri. This figure which has its back turned to the spectator is admirably designed.

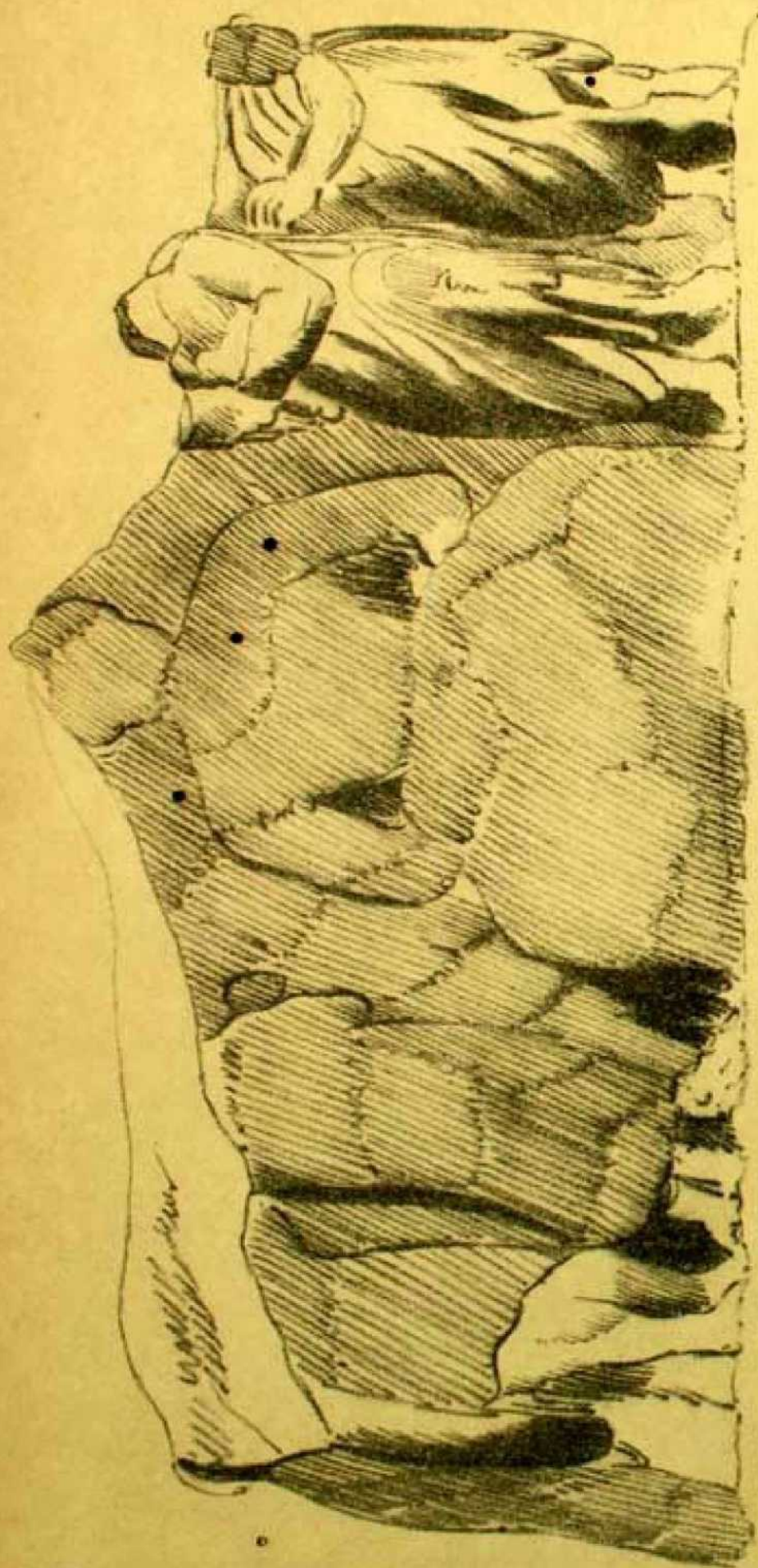
In the back ground are five other figures; one with flowing hair like figure 3, interposes his head, as if listening, between the chief

\* Possibly the "nya grodha" *Ficus religiosa*.





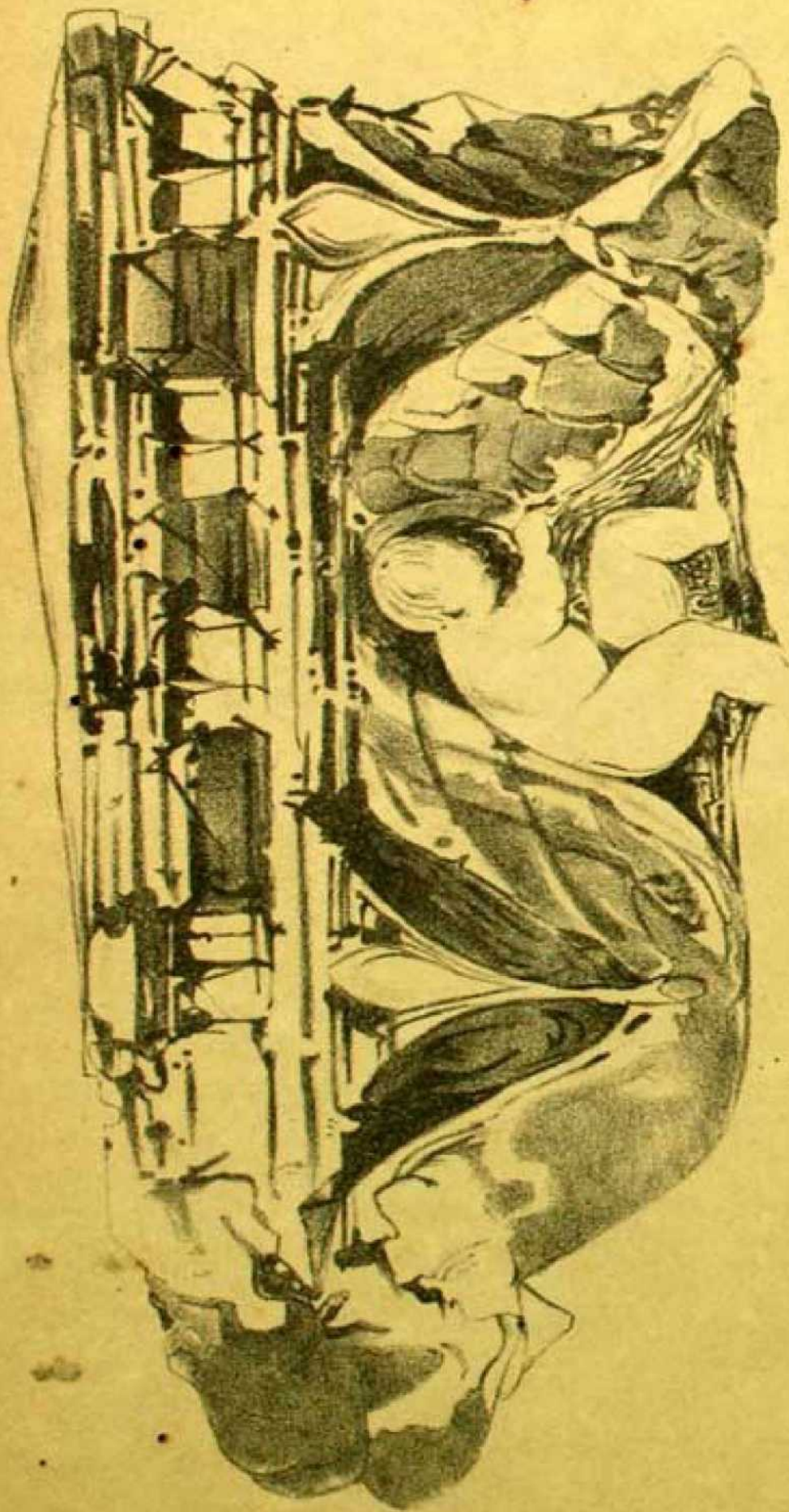




*Actual size.*

*In Black, Asiatic Lith. Press.*





*Actual size.*

*T. Black & Asiatic Lith. Press.*



figure and the prisoners. The other four are too mutilated to be clearly made out.

What meaning this group may be intended to convey, it is not easy to assert with any degree of certainty; it may represent the execution of some criminal, or, what seems to me a more probable interpretation, the chief figure may be intended for Sākya Sīṇha, interposing his authority to deliver a captive or criminal from the hands already lifted up to slay him, and this supposition seems the more likely from the evident curiosity and astonishment with which the sentence is heard.\*

Fig. 7 (Plate XXXII.)—Represents a party of three females in attitudes expressive of grief or fear and supplication; one is standing at what is apparently a draped altar before a pilaster, which with another close by are similar to those before described, but very "squat," and diminishing in size towards the top beneath the base of the capital.

Of this sculpture I cannot attempt any explanation; it is evidently of the same class as the above, and both were probably members of a series of similar basso relievos. I understand a third has found its way into the possession of Capt. Burnett, Horse Artillery, but I am not aware of its subject.

Fig. 8 (Plate XXXIII.)—Is a very curious and interesting sculpture, as bearing on the nature of the building; it is unfortunately almost defaced, but is unquestionably a cross-legged figure of Budh with two worshippers on each side, having their hands clasped in supplication.

Fig. 9 (Plate XXXIV.)—Is a portion of a very curious and elegant cornice; it is chiefly supported by the coils of a huge serpent (?) between which, a boy is sporting; below and above are brackets composed of a species of trefoil; altogether it has a very graceful effect, and might be imitated with good effect in modern Architecture.

Fig. 10 (Plate XXXV.)—Is a small seated figure wearing a short tunic and boots. Capt. Hogge possesses a better specimen on a large scale which I have seen and which has been exhibited at a meeting of the Asiatic Society: this also came from Jamāl Giri. It is evidently imitated from a European model, and I should guess as an

\* The presence of females, as was pointed out to me by Major Edwards, favours the idea that the prisoner is a criminal offender, not a captive in war, and perhaps the women's presence may point to the nature of his offence. This however can be a mere conjecture. In Laidlay's notes to Fahian, p. 66, Sākya Muṇi is described as preaching to a congregation of whom 500 were female mendicants.



attempt to represent the king of gods. Capt. Hogge's figure is more like the usual type of the Greek "Zeus" than mine.

Fig. 11 (Plate XXXVI.)—Is a head with a nearly perfect "halo" or nimbus round it; it apparently has belonged to a figure similar to Nos. 1 and 2, but of smaller size; it also bears the "tilak" or caste-mark between the eyes.

Fig. 12 (Plate XXXVII.)—Is part of a "nimbus" apparently, which must have belonged to a very large head, and is ornamented with some emblematic figure now too mutilated for identification.

Fig. 13 (Plate XXXVIII.)—Is also a very mutilated specimen, but it is worthy of remark for the girdle round the waist, which is composed apparently of beads or a knotted cord. The right hand carries what may have been the handle of a Chouri, and it therefore possibly represents an attendant and has formed part of a large group.

The stone in which these figures are cut is chiefly a light greyish blue limestone, but some are cut in what is apparently a micaceous schist, which is, however, but slightly laminated.

In these sculptures two general characteristics may be noticed.

As to the first of these, the share which Grecian art must have had in their production, I do not think any one who examines them can have any doubt. Indeed the figure 4 is alone sufficient to settle the question, if its evidence were not also corroborated by the general grace of the design and the classic arrangement of the drapery of all the sculptures generally.

Nor could it have been Greek art at a very late or debased period; to compare their execution with that of the coins of the Bactrian kings, there is, I think, nothing approaching to these figures of later dates than Menander.

Another argument for assigning them to a period not long subsequent to the establishment of the Bactrian monarchy, is afforded by the style of architecture which they affect.

From Major Cunningham's researches it would appear that the Corinthian architecture did not take firm root in India, and he traces the style to which he has given the name of "Arian" to a Doric origin.

This however is rather negative evidence, for though the "Arian" style was certainly extensively prevalent south of the Indus at a very ancient period, yet some of the most promising ground for architectural remains lying Trans-Indus, is at present virtually unexplored.



(357) 1. 1. 1.



PLATE XXXVI.







Fig 13. Actual size

*Black limestone, 18th Dyn.*



The second remarkable feature in these sculptures is their decided Buddhist character.

This indeed is not perhaps so self-evident as their indebtedness to Greek art, but still, I think, quite sufficiently so to leave little doubt that the edifice they adorned was erected by votaries of that faith.

The strongest evidence to this point is that afforded by figure 8 ; but the elongated ears and decided top-knots which all the figures without exception show, are pretty strong proofs also ; if also the figures 1, 2, and 11 are allowed to represent Sákya Siñha, there is then little question of the nature of an edifice which contained *three* representations of that holy personage at least.

I am not blind, however, to some anomalies which seem to stand in the way of this conclusion ; the employment of the "tilak" and the very un-Buddhistical appearance of figure 3 for example ; but I do not think they are incapable of explanation. Figure 8 may have represented a person, a pure Hindu, whose likeness was necessary to the completion of some sculptured story.

And as the period to which I propose to assign these sculptures, is that of the very earliest imperfect introduction of Buddhism Trans-Indus, there is no difficulty—but rather confirmation of my supposition—to be derived from the anomalous traces of Hindu superstition, such as the occurrence of the "tilak."

For we know from the Kapur di Giri inscription (Tablet V.) that the precepts of Buddhism had been but imperfectly observed north of the Indus, at the time when that was written ; and supposing these edicts to be the work either of Asoka or of a later king, the lax observance of the injunctions of the Buddhist law at an earlier date is equally established, and there is therefore no improbability, but rather the contrary, that in the first erected Buddhist buildings we should find some admixtures of the characteristics of other tenets.

The preponderating Buddhist character of the remains warrants, therefore, the attribution of their origin to people of that belief ; assuming then these two data, the early Greek and early Buddhist character of these remains, I shall attempt to assign to them at least an approximate date.

On the coins of the Greek kings of Bactria—certainly until the time of Azas—there is not one symbol, I think, that will even bear a



Buddhist interpretation, nothing at any rate of that profusion of emblem with which Buddhistic remains are generally adorned.

On the contrary the leaning of the Greek dynasties seems rather to have been to a Mithraic faith, such as there is at least some reason to believe Buddhism originally superseded.

And if anywhere the existence of Buddhism under the new "régimè" be a question, it certainly would be so in the countries Trans-Indus, for according even to Buddhist authority it was introduced there from India as a new faith by a dynasty of foreign invaders. Its continued existence even, therefore, would be scarcely probable when the countenance of those in power was withdrawn from it.

But even supposing it continued to *exist*, it is highly improbable that it remained as a dominant faith, or even in such a flourishing condition under the Greek rulers, as that its votaries should be enabled to raise buildings as extensive and elaborately ornamented as that of Jamál Giri apparently was.

It therefore can only be a question whether to attribute this edifice to the period when Buddhism flourished Trans-Indus, under the patronage of the Maurya dynasty, and antecedent to their expulsion by the Greeks of Bactria from all territories to the north of that river, or to a period altogether subsequent to the overthrow and dismemberment of the Greco-Bactrian empire.

But, as we have seen above, the purity of their style of art forbids our attributing these sculptures to so late an era as the latter, while the mixed character of the Buddhism they display would certainly harmonize rather with the history of that faith in the former than in the latter period.

Supposing therefore that they belong to the period when Buddhism was dominant Trans-Indus under the Maurya monarchs, it follows they could not have been of later date than the reign of Demetrius, who having made conquests in India proper, must *a fortiori* have held all the Trans-Indus provinces. This would place their most recent possible date as little later than 200 B. C.

But it is probable that they are not even so late, for we are now able, on the evidence of the binominal coin recently published from the Vienna Cabinet, to state that Agathocles was, if not a contemporary, at any rate an immediate successor, of Diodotus.



Now whether the Diodotus mentioned on the coin be the first or second of the name (if there *was* a second) still this coin proves that Agathocles must have been anterior to Euthydemus, for Polybius makes the latter found his claim to the favourable consideration of Antiochus on the fact that he had expelled the descendants of the original leaders of the Bactrian revolt. But Euthydemus was found by Antiochus firmly seated on the Bactrian throne, at a date not later than 210 B. C. and as from the tolerably frequent occurrence of the coins of Agathocles, there is reason to suppose he had a reign of some duration, and as the reign of Pantaleon, though probably a short one, must have also preceded that of Euthydemus, it seems likely that the reign of Agathocles and his dynasty commenced not *later* than 225 B. C.

I now proceed to shew that there is reason to believe that it was this dynasty of Agathocles which completed the expulsion of the Maurya dynasty from their Trans-Indus provinces.

As Demetrius is the first king mentioned as having dominions in India proper, it is fair to suppose that Agathocles, now known to be his predecessor, can only have reigned north of the Indus.

The use however of the square "lath" character on the coins of this latter king and Pantaleon, is evidence that he must have reigned where it was in familiar use.

Now there is abundant evidence to shew that this character was *not* the *indigenous* alphabet of the countries Trans-Indus.

It is never used on the coins of any other of the earlier Greek kings of Bactria, many of whom reigned not only north of the Indus, but far to the southward of that river.

Again while the edicts of Allahabad, Dehli, &c. are published in the "lath" character, the contemporary edict of Kapur di Giri is published in the *Bactrian* Pali.

Other evidence might be adduced, but it is, I think, a proposition hardly likely to be gainsaid, that the Bactro-Pali alphabet was indigenous north of the Indus, while the square "lath" character was the character universally in use in central India, and that both were contemporaneously flourishing from a period of at least 300 B. C. to about 100 B. C.

To account therefore for the use of the "lath" alphabet on the coins of kings who reigned where it was *not* indigenous, it is necessary to seek for some extraordinary reason.



Such a reason is afforded us, if we suppose that Agathocles ruled in those countries north of the Indus which the Maurya dynasty had held, and where it is probable that they had introduced the alphabet of their own original seat as the court and state character. Just as at a subsequent period Mahomedan conquerors introduced into India proper, the use of the Persian character, and as European conquerors have impressed their coin with inscriptions in their own language.

We know that Chandra Gupta (Sandracottus) held Trans-Indus provinces (v. Strabo in Lassen's *Pentapotamia*, p. 8; also *Mudra Rākshasa* in do. p. 61), and Fahian relates (see Laidlay's edition, p. 65), that his great-grandson, the son of Asoka, reigned in Khian tho wei or "Gandhara," which lying between the Suastus and Indus, of course included Eusofzye and Jamal Giri.

It is therefore highly probable that Agathocles's dominion extended to Gandhara (and this the distribution of his coins also seems to shew), and "par consequence" that the Mauryas were expelled from Euzofzye before 225 B. C., which in such case must, as I have shewn before, be looked upon as the latest probable date for the sculptures under notice, unless, indeed, we suppose from the use of the "lath" character that the conquering Greek adopted the state religion as well as the state alphabet of his predecessors.

My next endeavour will be to assign the *earliest* possible date to which these sculptures may reach.

This of course will be determined by the earliest date at which Buddhism can be shown to have flourished Trans-Indus.

That Chandra Gupta and his son were *not* Buddhists is to be inferred from the notice of his grandson's conversion, and the emphasis laid on it.

We know from Justin that Chandra Gupta only first began to *dream* of empire when he fled from Alexander's presence, which event must have occurred about 325 B. C., and as he was sufficiently powerful immediately after Alexander's death to reconquer the whole of that monarch's Indian empire, his accession to the throne of Magadha must have occurred in the interim, say about 324 B. C.

The shortest periods *anywhere* assigned to the reigns of Chandra Gupta and his successor are respectively 8 and 25 years.

Adding four years as the shortest period anywhere assigned for



Asoka's reign *previous* to his conversion, and we have 287 B. C. as the earliest possible date for the triumph of Buddhism Trans-Indus.

But even this date is probably far too early. No *one* authority assigns a shorter period for the united reigns of Chandra Gupta and his son than 49 years, which would bring down Asoka's conversion to 271 B. C.

For these reasons I conclude that the earliest *possible* period to which these figures can be assigned is 287 B. C. and the latest 200 B. C., while there is every probability that the age of their execution was between 271 and 225 B. C., a period of only 46 years.

I confess that I feel myself inclined to assign the erection of Jamal Giri to the author of the Kapur di Giri edict, and to assign both to the reign of the great Asoka, and I trust that the confirmatory evidence which I deduce from the mixed character of the religion indicated by the sculpture, may be my excuse for offering a few remarks on this well-debated subject ; premising that I do so only conjecturally for the consideration of the Society, and not with any confidence as to their correctness.

As I have said, the mixed character of the sculptures, though Buddhist indications preponderate, is of itself evidence of the existence of a Buddhism greatly differing from the orthodox practice of Buddhist nations of the present day.

That such was the case when the Kapur di Giri inscription and its fellows were promulgated, we might gather from internal evidence, if it were not expressly stated by the inscriptions themselves.

Not only the inscriptions lament the imperfection of moral and religious practices among the Trans-Indus nations, but the author specially notices the abrogation of an edict *issued by himself* as "obstructive to the progress of the faith."

It has been inferred that the issue of the abrogated edict must have preceded the monarch's conversion, and that therefore as some of the edicts are of earlier and some of later date, that the religion they promulgate must be different, and certainly that the earlier edicts cannot have recommended Buddhism, and it has even been further argued that as there is no perceptible difference in the tenets enumerated by the earlier and later edicts that therefore *neither* can be Buddhist.

But these assumptions seem scarcely warranted.





The abrogation of the edict proves no more than an admission that in the exuberance of new-born zeal, or the half-informed ignorance of recent conversion, the royal legislator had put forth an edict the ultimate tendency of which was incompatible with the interests, or the esoteric tenets, of the faith he had intended to disseminate.

Such a state of religion as this both in the monarch and the people would well accord with the anomalous Buddhism of the sculptures under review.

But supposing even that the Buddhism of the edicts and of the sculptures came up even to the orthodox standard of the day, it is fair to conclude upon general grounds that that standard must have varied considerably from the Buddhism of the present day, or even of Buddhism as represented in its oldest extant sacred writings.

No creed, the history of which has come down to us, has preserved its purity uncorrupted through a long series of years, and it yet remains to be shewn that Buddhism is an exception to all experience, that it alone of all religions, has preserved its original form intact and free from all novelties for far above two thousand years, and that the faith of Sákya Muni was identical in *all* respects with that of Asoka, or either with the tenets of the present day.

It would indeed be possible to demonstrate that this is not the case,—that novelties and corruptions *have* crept in, but it is sufficient to allude to the want of complete identity in the practices of Buddhist nations of our own time, in spite of the most extraordinary efforts *recorded* to have been made to preserve uniformity, as a sufficient proof that there *have* been departures from the original model.

It is not, however, objected to the pillar edicts that they contain any thing *contrary* to the doctrines of Buddhism, but that they omit all mention of its leading tenets, all its usual forms of invocation, and all allusion to the most remarkable facts in its history.

But supposing for the sake of argument that the doctrines and the practices of Buddhism in these days were literally identical with those subsequently prevalent, it was yet the object of the royal legislator to enforce the *practices*, rather than to disseminate (supposing he himself understood them) the doctrinal niceties, of the Buddhist faith.

With respect moreover to the want of historical allusions, if the fragment described by Major Kittoe in the Society's Journal, No. 102,





be, as it seems to be, rightly rendered, this objection will no longer remain.

The historical facts which I have mentioned with respect to the sculptures bear with some force on the period of the edict.

It is extremely improbable that, from Agathocles to the Scythian irruption, any monarch who reigned north of the Indus should have put forth such an edict as that of Kapur di Giri, for, as I have before said, the tendencies of the Greek rulers were Mithraic rather than Buddhist.

That they were issued subsequent to the Scythian irruption is opposed in many ways to their internal evidence, and if previous to Agathocles, as we have seen, they were probably anterior to B. C. 225.

Indeed every one of the Trans-Indus provinces which could have formed part of the dominion of Agathocles are enumerated by the author of the edict as in his own possession even to Kamboja or Kabul; and as the author held universal rule from Kabul to Cuttack, he can scarcely have been either Agathocles himself or any subsequent Scythian invader.

The period between 271 and 225 which I have assigned to the sculptures coincides well also with that deducible as the period of the edicts from the name of the Greek kings mentioned in them.

The period from B. C. 272 to B. C. 256 alone, in all the range of Greek history, presents the names of five kings of the denominations mentioned, as reigning contemporaneously. They have accordingly been already identified by Prinsep and others as the kings alluded to.

They are as follows :

|                                 | Ascended the throne. | Died                                        |
|---------------------------------|----------------------|---------------------------------------------|
| Alexander of Epirus, . . . . .  | B. C. 272            | —                                           |
| Magas of Cyrene, . . . . .      | B. C. 305            | 256                                         |
| Ptolemy Philadelphus, . . . . . | 285                  | 246                                         |
| Antigonus Gonatas, . . . . .    | 276                  | 243                                         |
| Antiochūs }<br>Soter, }<br>or   | 282                  | 262                                         |
| Antiochus }<br>Theos, }         | 262                  | was expelled from<br>Bactria 256 or<br>255. |

Professor Wilson supposes that Antiochus the Great must be the



king mentioned under that name, because the Indian expedition of this prince brought him alone of the monarchs who bore it personally in contact with any Indian sovereign. From this he argues that the princes named not being contemporary, no deduction as to the date of the inscription can be drawn from their mention.

But this inference is scarcely borne out by facts. The kingdom of the promulgator of the pillar edicts must have extended much along the present N. W. Frontier of British India, indeed somewhat beyond it.

Up to 255 or 256 B. C. the whole of the country lying west of this, owned the sway of the earlier Syrian monarchs—of Seleucus Nicator, Antiochus Soter and Antiochus Theos. We have no evidence of rebellion against them; on the contrary we know that even the coin of these countries was struck in their names.

Hence it is reasonable to presume that they exercised a general superintendence over the government; that they received reports of the administration; and issued their mandates to the local governors, and that they drew into their treasuries if not the whole surplus revenues, at least a considerable tribute from each district, that, in short they kept up such a general official intercourse with their oriental dominions as would make their names familiar, and even the current course of events in the west generally known to their subjects in the east.

Commerce too which we have evidence was both at an earlier and a later period carried on viâ Pontus between the nations of Southern Europe and Central Asia must have lent its aid to familiarize the people of the Greek dominion of the East with the names and occurrences of the West.

But further than this, it is expressly recorded both by Strabo and Athenæus (*De Pentapotamia Indica*, p. 44) that the friendship which existed between Chandra Gupta and Seleucus was continued by their sons, and that an embassy went also from Antiochus Soter to Palibothra.

Surely it is far more probable that through channels such as these the royal author of the pillar edicts (being as he expressly states on friendly terms with the Syrian monarch) should have deemed an accurate knowledge of the names and circumstances of his neighbours



then that he should have gained it by personal intercourse at a later period when, during the hurried expedition of Antiochus the Great, Greek and Indian were placed for a few short weeks in actual contact, but subsequently to which period and for many years before it the general communication between Greece and India must have been infinitely more interrupted than before the Bactrian and Parthian revolts in 255 and 256 B. C.

The probability hence deduced that Antiochus Soter or Antiochus Theos was the monarch meant is still further strengthened by another circumstance.

The author of the pillar edict, an Indian monarch, records that he was in possession of the Trans-Indus provinces of Kamboja, Gándhára, &c., and, as we have seen before, there is every probability that these had been re-conquered by the Greek kings of Bactria, previous to Euthydemus, and therefore *considerably antecedent* to the advent of Antiochus the Great.

The mention therefore of either the first or second Antiochus, (*not incompatible with facts,*) with that of Ptolemy Philadelphus, is scarcely less to be expected, for his intercourse with India is recorded to have been unusually great.

The name of Magas is unmistakeable, and too peculiar to be confounded with that of any contemporary monarch, and though of comparative insignificance, its mention may be accounted for, by the connection of Magas with the Syrian kings, he having married the daughter of the first Antiochus. Similarly the introduction of the name of Antigonus Gonatus may be owing to his marriage with the sister of the same Antiochus.

The name of Alexander of Epirus seems more out of place; but, though a king of small historical celebrity, he was a warlike and turbulent prince, whose proceedings doubtless attracted much of the attention, and influenced many of the movements, of his contemporaries, and was not therefore unlikely to be noticed in a record of the monarchs of his time.

If therefore we assume that the above princes were those intended by the names in the edicts, and allowing a reasonable time for the transmission of news from the west to the east, say one year, it follows that the particular edict in which they stand named must have been promulgated between 271 B. C. and 255 B. C.



Now this tablet is dated in the twelfth year of its author's reign, which by this calculation would place his accession, at from 283 to 267 B. C.

It has been already seen that the earliest possible date of Asoka's accession (4 years before his conversion at the shortest calculation) is 291 B. C. Professor Wilson has shown that it cannot be brought down later than 266 B. C.

The medium between the two first dates would give B. C. 275, that between the two last 278 B. C., or a little more as the date of accession.

The date of the 12th year would thus be 266 or 263 B. C., both dates making the Antiochus mentioned Antiochus Soter, whose connection with India, with Magas and Antigonos renders the attribution in every way most probable.

To my knowledge there remains but one further difficulty in identifying Asoka as the author of the pillar edicts.

This objection refers to the non-employment, by the author of the pillar edicts, of the name of "Asoka" or "Dharma Asoka" in designating himself.

But to this it may be replied that neither of these was the king's *original* name, nor did the term "Asoka" evoke any agreeable recollection; in fact so far from being a title of honor it was a nickname of reproach,\* which the Buddhists after the king's conversion modified—being unable to obliterate it—into "Dharma Asoka," as is noticed by Prinsep in the Society's Journal for September 1837, p. 794.

It is therefore *not to be expected* that the king should himself perpetuate the use of the opprobrious epithet, and it is, indeed, far more consistent with probability that he should use, in a religious work, a title like "Piyadasi" with reference to his own sanctity. To sum up—I trust I have shown the probability that the edicts belong to a certain period of time, and that not an extended one.

That there is strong evidence that their author was Asoka himself.

Thirdly, that the sculptures described, belong to a period which includes within its limits that to which the edicts may be ascribed.

And lastly, that the sculptures possess characters which connect them closely with the peculiar state of manners and religion described

\* On account of the murder of his brothers.





in—or to be inferred from the edicts as existing at—the time of their promulgation, and that therefore there is strong ground for attributing them to the same period and the same author.

I must again claim the Society's indulgence for venturing upon ground already so well debated. My anxiety to clear up to the farthest point possible, the history of these beautiful and interesting remains must plead my excuse.

I annex also an almost indecipherable inscription found at Jamál Giri, on a block of marble bearing a rude figure of a man and an animal, evidently of far later date than the rest of the remains.\*

Two other specimens of sculpture are also figured as Nos. 14 and 15, (Plates XXXIX. and XC.) which were found at Peshawur itself; the first partakes much of the character of the Jamál Giri sculptures, though of inferior design and execution. It represents, without doubt, the sacrifice of a human victim on a low stone altar.

Curious in itself, there is unfortunately nothing to explain either its date or the people to whom it belonged.

No. 15 is simply a figure of Buddh of comparatively recent workmanship.

Further materials for antiquarian research undoubtedly exist all over the Derajat and Peshawur valley; Lieut. Stokes informs me, that while recently and hurriedly riding on duty through an unfrequented part of the latter country, about five miles from Goojur Ghurri, the recent temporary location of the Guide Corps, he came upon ruins† closely resembling those of Jamál Giri, but more extensive and better preserved, and others unquestionably exist elsewhere, as at Akra, &c. &c.

\* The inscription mentioned in the text has not been received.—Eds.

† Upon a hill named "Takht-i-Bai." An isolated eminence at the end of the low range of hills which separates the Eusofzye from the Luncoan valley, it is N. E. of Peshawur and about 35 miles from Hashtnuggur.

On account of the novelty and very high interest of the subject, the Editors have thought fit to give insertion to this memoir without waiting until all the drawings arrive. The remainder of the series shall be published immediately on their receipt from Mr. Bayley.

Mr. Bayley expresses his sense of obligation, in letters to the Society, dated 20th and 23rd October, to Major H. B. Edwards, C. B.; to his Lady who has made the drawing of the pilaster and cornice, and figures 4 and 9; to Lieut. A. H. Bamfield, H. A. who furnished him with a sketch of figures 2 and 11 and of the detached head; and to Lt. Macleod Innes of the Engineers, to whom he is indebted for the drawing of No. 14.—Eds.



*Meteorological Register kept at the Field Hospital at Rangoon, for the Month of August, 1852.*



AT NOON.

AT 9 A. M.

SUNRISE.

|        | Thermometer. |        | Baro-<br>meter. | Force and<br>direction of<br>Wind. | Aspect of<br>Sky. | Thermometer. |        | Baro-<br>meter. | Force and<br>direction of<br>Wind. | Aspect of<br>Sky. | Thermometer. |         | Baro-<br>meter. | Force and<br>direction of<br>Wind. | Aspect of<br>Sky. |
|--------|--------------|--------|-----------------|------------------------------------|-------------------|--------------|--------|-----------------|------------------------------------|-------------------|--------------|---------|-----------------|------------------------------------|-------------------|
|        | Wet.         | Dry.   |                 |                                    |                   | Wet.         | Dry.   |                 |                                    |                   | Wet.         | Dry.    |                 |                                    |                   |
| 1st    | 75.5         | 77     | 29.94           | S. b. E. lt.                       | Cirro-strati.     | 78           | 80.5   | 29.96           | E. light.                          | Cumuli.           | 77.5         | 80      | 29.93           | S. W. light.                       | Rain.             |
| 2nd    | 76           | 78     | .91             | N. W. do.                          | Few cirri.        | 78.5         | 82     | .92             | S. b. E. do.                       | Ditto.            | 79           | 85.5    | .90             | S. fresh.                          | Cumuli.           |
| 3rd    | 76.5         | 77     | .91             | S. do.                             | Cirro-strati.     | 79           | 79     | .94             | S. W. do.                          | Cumulo-strati.    | 78.5         | 83      | .93             | S. W. do.                          | Ditto.            |
| 4th    | 77.5         | 77.5   | .90             | S. W. do.                          | Ditto.            | 78.5         | 81.5   | .99             | Ditto.                             | Cumuli.           | 79.5         | 82      | .95             | Ditto.                             | Ditto.            |
| 5th    | 75           | 76     | .95             | E. do.                             | Ditto.            | 77           | 80.5   | .97             | S. do.                             | Ditto.            | 78           | 79.5    | .95             | S. b. W. lt.                       | Strati.           |
| 6th    | 77           | 78     | .95             | S. b. W. do                        | Rain.             | 76.5         | 77.5   | .96             | S. W. do.                          | Cumulo-strati.    | 79.5         | 82      | .95             | Ditto.                             | Cum. strati.      |
| 7th    | 77           | 78     | .96             | Ditto calm                         | Strati.           | 75.5         | 76     | .97             | Ditto.                             | Rain.             | 79           | 81.5    | .95             | S. W. fr.                          | Cumuli.           |
| 8th    | 76           | 77     | .95             | S. E. lt.                          | Ditto.            | 77           | 79     | .98             | Ditto.                             | Strati.           | 80           | 84.5    | .94             | S. b. W. do.                       | Ditto.            |
| 9th    | 75           | 75     | .93             | S. W. do.                          | Cumulo-strati.    | ..           | ..     | ..              | ..                                 | ....              | 79.5         | 83.5    | .93             | Ditto lt.                          | Ditto.            |
| 10th   | ..           | ..     | ..              | ..                                 | ....              | 75.5         | 79.5   | .94             | Ditto.                             | Ditto             | 77           | 80      | .93             | S. W. do.                          | Ditto.            |
| 11th   | 76           | 77     | .93             | S. W. lt.                          | Cumuli.           | 78           | 80     | .93             | Ditto fresh.                       | Cumuli.           | 77           | 78.5    | .92             | Ditto.                             | Rain.             |
| 12th   | 75           | 76     | .92             | Ditto.                             | Strati.           | 76           | 76.5   | .95             | Ditto light.                       | Strati.           | 76           | 78      | .92             | Ditto.                             | Strati.           |
| 13th   | 77           | 77.5   | .94             | Ditto.                             | Ditto.            | 81           | 84     | .96             | Ditto fresh                        | Cumuli.           | 80           | 82      | .94             | Ditto.                             | Cumuli.           |
| 14th   | 76.5         | 77.5   | .97             | N. E. do.                          | Cirro-strati.     | 78.5         | 79.5   | 30.             | N. E. light.                       | Cumulo-strati.    | 81           | 84.5    | .95             | S. fresh.                          | Strati.           |
| 15th   | 77           | 78     | .99             | S. W. do.                          | Ditto.            | 79.5         | 80.5   | 30.             | S. b. W. do.                       | Ditto.            | 79.5         | 81      | .98             | S. light.                          | Cumuli.           |
| 16th   | 77           | 77.5   | .98             | S. E. do.                          | Ditto.            | 79           | 81     | 29.97           | S. W. do.                          | Strati.           | 80.5         | 83      | .93             | S. W. do.                          | Ditto.            |
| 17th   | ..           | ..     | ..              | ..                                 | ....              | 78           | 79     | 30.             | E. do.                             | Ditto.            | 78.5         | 80.5    | .97             | S. E. do.                          | Rain.             |
| 18th   | 75.5         | 77.5   | .97             | E. b. N. lt.                       | Strati.           | ..           | ..     | ..              | ..                                 | ....              | 76.5         | 77.5    | .94             | Ditto.                             | Ditto.            |
| 19th   | 76           | 77     | .97             | S. W. do.                          | Ditto.            | 77           | 78     | 30.02           | S. W. do.                          | Ditto.            | 77.5         | 78      | .99             | Ditto.                             | Strati.           |
| 20th   | 76           | 77     | 30.00           | E. b. S. do                        | Cirro-strati.     | 76           | 77     | .05             | S. do.                             | Ditto.            | 76.5         | 78.5    | 30.02           | S. fresh.                          | Ditto.            |
| 21st   | 75           | 75.5   | .03             | S. E. do.                          | Rain.             | 75           | 76     | .05             | S. E. do.                          | Rain.             | 77           | 78.5    | .03             | S. E. lt.                          | Ditto.            |
| 22nd   | 76           | 77     | .05             | Ditto.                             | Cirro-cumuli.     | 77           | 78.5   | .07             | E. S. E. do.                       | Cirro-cumuli.     | 76.5         | 78      | .05             | W. do.                             | Cum. strati.      |
| 23rd   | 74.5         | 75     | .04             | N. b. W. do.                       | Rain.             | 77           | 78.5   | .06             | E. N. E. do.                       | Strati.           | 78.5         | 81      | .04             | E. b. S. do.                       | Cumuli.           |
| 24th   | 75           | 76     | .04             | E. b. N. do.                       | Cirro-strati.     | 77           | 80     | .05             | E. b. N. do.                       | Cirro-cumuli.     | 78.5         | 83      | .02             | Ditto.                             | Cirri.            |
| 25th   | 75           | 77     | .05             | E. S. E. do.                       | Strati.           | 77           | 78     | .06             | S. E. do.                          | Strati.           | 77           | 81      | .02             | S. E. do.                          | Cumuli.           |
| 26th   | 76           | 77     | .07             | E. N. E. do.                       | Cirri.            | 78           | 82     | .09             | W. b. S. do.                       | Cirro-cumuli.     | 77.5         | 85.5    | .07             | Ditto.                             | Ditto.            |
| 27th   | 77           | 78     | .06             | S. W. do.                          | Cloudy.           | 78.5         | 82.5   | .09             | W. S. W. do.                       | Cumuli.           | 81           | 85.5    | .04             | Ditto fresh.                       | Ditto.            |
| 28th   | ..           | ..     | ..              | ..                                 | Cirri.            | ..           | ..     | ..              | Ditto.                             | ....              | 81           | 87      | .02             | S. W. lt.                          | Ditto.            |
| 29th   | 78           | 79     | 29.90           | S. W. lt.                          | Cumuli.           | 80           | 83     | .01             | S. do.                             | Ditto.            | 81           | 86.5    | 29.97           | S. E. do.                          | Ditto.            |
| 30th   | 77           | 79     | .95             | E. N. E. do                        | Ditto.            | 80.5         | 83     | 29.97           | W. b. S. do.                       | Cirri.            | 79.5         | 83.5    | .96             | S. W. do.                          | Ditto.            |
| 31st   | 76           | 79     | .95             | S. E. do.                          | Ditto.            | 79           | 80     | .96             | S. E.                              | Cumuli.           | 80.5         | 85.5    | .94             | S. E. do.                          | Ditto.            |
| Total. | 2130.5       | 2161.0 | 839.21          |                                    |                   | 217.75       | 223.25 | 839.92          |                                    |                   | 2438.5       | 2538.0  | 929.08          |                                    |                   |
| Mean.  | 76.0893      | 77.179 | 29.9718         |                                    |                   | 77.768       | 79.803 | 29.9972         |                                    |                   | 78.661       | 81.8709 | 29.9703         |                                    |                   |



*Meteorological Register kept at the Field Hospital at Rangoon—(Continued.)*



| AT 3 P. M.   |        |                 |                                    | AT SUNSET.        |              |        |                 | AT 9 P. M.                         |                       |                          |                               |
|--------------|--------|-----------------|------------------------------------|-------------------|--------------|--------|-----------------|------------------------------------|-----------------------|--------------------------|-------------------------------|
| Thermometer. |        | Baro-<br>meter. | Force and<br>direction<br>of Wind. | Aspect of<br>Sky. | Thermometer. |        | Baro-<br>meter. | Force and<br>direction<br>of Wind. | Aspect of<br>Sky.     | Rain<br>Gauge<br>Inches. | Remarks.                      |
| Wet.         | Dry.   |                 |                                    |                   | Wet.         | Dry.   |                 |                                    |                       |                          |                               |
| 78           | 80     | 29.89           | W. b. S. lt.                       | Cumuli.           | ..           | ..     | ..              | ..                                 | ..                    | 0.03                     | Fine clear day.               |
| ..           | ..     | ..              | ..                                 | ..                | ..           | ..     | ..              | ..                                 | ..                    | .30                      | Ditto; rained last night.     |
| 75.5         | 78     | .92             | S. W. lt.                          | Rain.             | ..           | ..     | ..              | ..                                 | ..                    | 1.52                     | Cloudy and sultry ditto.      |
| 74.5         | 75.5   | .93             | Ditto.                             | Ditto.            | ..           | ..     | ..              | ..                                 | ..                    | .20                      | Fine morning, cloudy evening. |
| 78.5         | 80.5   | .93             | Ditto.                             | Cumuli.           | 76           | 76.5   | 29.94           | S. W. lt.                          | Cum.-st.              | .60                      | Shower at noon.               |
| 76.5         | 77     | .92             | Ditto.                             | Strati.           | 76.5         | 77.5   | .93             | Ditto.                             | Strati.               | 1.20                     | Rained last night—cloudy.     |
| 75           | 76     | .95             | Ditto.                             | Rain.             | ..           | ..     | ..              | ..                                 | ..                    | .40                      | Dark gloomy day.              |
| 74.5         | 75     | .93             | Ditto.                             | Ditto.            | 74           | 74.5   | .91             | Ditto.                             | Ditto.                | 1.10                     | Do. do. rain.                 |
| 77           | 80     | .90             | Ditto.                             | Ditto.            | 77           | 79.5   | .91             | Ditto.                             | ..                    | 2.40                     | Rained heavily last night.    |
| 77.5         | 79.5   | .93             | Ditto.                             | Cumuli.           | 75           | 77     | .91             | Ditto.                             | ..                    | ..                       | Fine day. No rain. [showers.  |
| 78           | 79.5   | .92             | Ditto.                             | Rain.             | ..           | ..     | ..              | ..                                 | ..                    | .10                      | Cloudy dull weather, slight   |
| 77.5         | 78.5   | .91             | S. do.                             | Ditto.            | 76           | 78     | .95             | S. lt.                             | Rain.                 | .05                      | Cloudy. Thunder at 9 P. M.    |
| ..           | ..     | ..              | ..                                 | ..                | 75.5         | 76.5   | .95             | S. W. do.                          | Strati.               | .55                      | Ditto ditto.                  |
| ..           | ..     | ..              | ..                                 | ..                | ..           | ..     | ..              | ..                                 | ..                    | 1.12                     | Wet night; ditto.             |
| 79           | 81     | .97             | S. lt.                             | Cumuli.           | ..           | ..     | ..              | ..                                 | ..                    | .22                      | Close sultry day.             |
| ..           | ..     | ..              | ..                                 | ..                | ..           | ..     | ..              | ..                                 | ..                    | .20                      | Thunder at sunset.            |
| ..           | ..     | ..              | ..                                 | ..                | 75.5         | 77     | .95             | S. E. do.                          | Ditto.                | 1.20                     | Cloudy; rain; ditto ditto.    |
| 78           | 79.5   | .94             | S. E. do.                          | Cumuli.           | 76.5         | 78.5   | .94             | Ditto.                             | Th. & hvy.<br>Clouds. | .60                      | Wet last night; cloudy.       |
| ..           | ..     | ..              | ..                                 | ..                | ..           | ..     | ..              | ..                                 | ..                    | 1.60                     | Cloudy; rain; dull weather.   |
| 78           | 78     | .99             | Ditto.                             | Cum.-st.          | ..           | ..     | ..              | ..                                 | ..                    | .70                      | Ditto ditto; gentle rain.     |
| 76.5         | 79.5   | 30.01           | E. S. E. do.                       | Ditto.            | ..           | ..     | ..              | ..                                 | ..                    | .50                      | Ditto ditto ditto.            |
| ..           | ..     | ..              | ..                                 | ..                | ..           | ..     | ..              | ..                                 | ..                    | .22                      | Ditto ditto ditto.            |
| 76           | 79     | 30.01           | W. b. S. do.                       | Cirro-st.         | ..           | ..     | ..              | ..                                 | ..                    | .70                      | Ditto ditto ditto.            |
| 78           | 82     | 29.99           | E. b. S. do.                       | Cumuli.           | 77           | 80     | .99             | W. b. S. lt.                       | Cumuli.               | .22                      | Ditto ditto ditto.            |
| 76           | 81     | 30.11           | S. E. do.                          | Ditto.            | ..           | ..     | ..              | ..                                 | ..                    | .36                      | Fine day, but cloudy.         |
| 78           | 83     | .02             | S. b. W. f.                        | Ditto.            | ..           | ..     | ..              | ..                                 | ..                    | None.                    | Ditto ditto ditto.            |
| 79           | 85     | 30.             | S. E. lt.                          | Ditto.            | 77           | 80     | 30.03           | S. W. lt.                          | Cir.-cum.             | None.                    | Ditto ditto ditto.            |
| 79           | 88.5   | 29.97           | S. W. do.                          | Ditto.            | 77           | 82     | 30.             | Ditto.                             | Cumuli.               | 0.24                     | Ditto ditto ditto.            |
| 80           | 84.5   | .95             | S. E. do.                          | Ditto.            | ..           | ..     | ..              | ..                                 | ..                    | 0.04                     | Ditto warm and sultry.        |
| 79.5         | 85.5   | .92             | S. W. do.                          | Ditto.            | ..           | ..     | ..              | ..                                 | ..                    | None.                    | Ditto ditto ditto.            |
| 79           | 81.5   | .93             | E. do.                             | Ditto.            | ..           | ..     | ..              | ..                                 | ..                    | .70                      | Showery weather.              |
| 1858.5       | 1927.5 | 718.94          | ..                                 | ..                | 990.0        | 1014.5 | 38.932          | ..                                 | ..                    | 17.07                    | ..                            |
| 77.4379      | 80.312 | 29.9558         | ..                                 | ..                | 76.1530      | 78.038 | 29.9479         | ..                                 | ..                    | ..                       | ..                            |

\* Rain fell on 28 days this month.

J. FAYRE.





*Hourly observations commencing at Sunrise on the 22nd Aug. 1852, for 24 hours. Rangoon.*

| August.<br>Sunrise<br>22nd to<br>Sunrise<br>23rd. | Thermometer. |              | Barometer. | Force and<br>direction of<br>wind. | Aspect of<br>sky. | Inches of rain. | Remarks.                                 |
|---------------------------------------------------|--------------|--------------|------------|------------------------------------|-------------------|-----------------|------------------------------------------|
|                                                   | Wet<br>Bulb. | Dry<br>Bulb. |            |                                    |                   |                 |                                          |
| Sunrise.                                          | 76           | 77           | 30.05      | S. E. lt.                          | Cir. cumuli.      | 0.22            | In guage. Sultry weather.                |
| 7 A. M.                                           | 76           | 77           | .05        | Ditto do.                          | Ditto.            |                 |                                          |
| 8                                                 | 77           | 78           | .07        | Ditto do.                          | Ditto.            | ..              | Blue sky here and there.                 |
| 9                                                 | 77           | 78.5         | .07        | E. S. E. do.                       | Cumulo-st.        | ..              | Heavy clouds pouring.                    |
| 10                                                | 77           | 78.5         | .06        | E. do.                             | Cumuli.           | ..              | Drops of rain.                           |
| 11                                                | 75           | 79           | .06        | W. S. W. do.                       | Cumulo-st.        | ..              | Thun. wind changed suddenly.             |
| Noon.                                             | 76.5         | 78           | .05        | W. do.                             | Ditto.            | ..              | Gloomy weather rain coming on.           |
| 1 P. M.                                           | 77           | 79           | .04        | E. b. S. do.                       | Ditto.            | ..              | Wind changed suddenly.                   |
| 2                                                 | 77           | 79.5         | .03        | E. b. N. do.                       | Cirro-strati      | ..              | Less cloudy.                             |
| 3                                                 | 77.5         | 78.5         | .02        | E. do.                             | Ditto.            | ..              | Ditto.                                   |
| 4                                                 | 77.5         | 79           | .01        | Ditto do.                          | Ditto.            | ..              | Drops of rain.                           |
| 5                                                 | 78           | 79           | .00        | Ditto do.                          | Ditto.            | ..              | Light rain continues.                    |
| 6                                                 | 78           | 79           | .02        | S. E. do.                          | Cumulo-st.        | ..              | Fine evening.                            |
| 7                                                 | 78           | 79           | .02        | Ditto do.                          | Ditto.            | ..              | Ditto.                                   |
| 8                                                 | 78.5         | 79           | .04        | Ditto do.                          | Ditto.            | ..              | Ditto.                                   |
| 9                                                 | 78           | 78.5         | .05        | Ditto do.                          | ..                | ..              | Shower coming on gentle rain falling.    |
| 10                                                | 78           | 78.5         | .06        | Ditto do.                          | Cirro-strati.     | ..              | Close, sultry.                           |
| 11                                                | 77.5         | 78.5         | .06        | S. b. W. do.                       | ..                | ..              | Shower coming on.                        |
| Midnight.                                         | 77           | 77.5         | .05        | Ditto do.                          | ..                | ..              | Heavy shower just over—air feels cooler. |
| 1                                                 | 77           | 77.5         | .04        | S. b. E. do.                       | Cumulo-st.        | ..              | Dark gloomy night.                       |
| 2                                                 | 76           | 76.5         | .03        | S. b. W. fr.                       | Ditto.            | ..              | A sharp shower just over.                |
| 3                                                 | 74           | 75           | .03        | S. W. do.                          | ..                | ..              | Heavy rain, dark and wet.                |
| 4                                                 | 74           | 75           | .03        | Ditto do.                          | Ditto.            | ..              | Ditto.                                   |
| 5                                                 | 74.5         | 75           | .04        | N. b. W. lt.                       | ..                | ..              | Gentle rain.                             |
| Sunrise.                                          | 74.5         | 75           | .04        | Ditto do.                          | Ditto.            | 0.70            | Ditto.                                   |
| Total,                                            | 1916.5       | 1945.        | 7602       |                                    |                   | 0.70            |                                          |
| Mean,                                             | 76.56        | 77.8         | 30.408     |                                    |                   |                 |                                          |





1852.]

## Meteorological Observations kept at Rangoon.

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## Abstract of the Meteorological Register for August, 1852.

Rangoon, 1st Sept., 1852.

| Thermometer<br>Sunrise. | Thermometer<br>9 A. M. |          |                               | Thermometer<br>Noon. |          |                               | Thermometer<br>3 P. M. |          |                               | Thermometer<br>Sunset. |          |                               | Thermometer<br>9 P. M. |          |                               | Remarks.                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|------------------------|----------|-------------------------------|----------------------|----------|-------------------------------|------------------------|----------|-------------------------------|------------------------|----------|-------------------------------|------------------------|----------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | Maximum.               | Minimum. | Min. of daily<br>observation. | Maximum.             | Minimum. | Min. of daily<br>observation. | Maximum.               | Minimum. | Min. of daily<br>observation. | Maximum.               | Minimum. | Min. of daily<br>observation. | Maximum.               | Minimum. | Min. of daily<br>observation. |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Wet. ..                 | 78.75                  | 76.09    | 77.77                         | 81                   | 75.5     | 78.63                         | 80                     | 74.0     | 77.43                         | 77                     | 74       | 76.15                         | 79.5                   | 74.5     | 76.59                         | Quantity of rain in August, 17.07 inches. The first half of the month, the weather has been wet and the prevailing wind S. W. During the third week, the wind variable, and frequent squalls with rain and thunder; the wind changing frequently and suddenly. The Barometer keeping high. The latter part of the month fine and warm, with occasional showers: in the last 3 days wind variable, but much from the S. E. |
| Dry.....                | 79.76                  | 77.17    | 79.80                         | 87                   | 77.5     | 81.87                         | 88.5                   | 75       | 80.41                         | 82                     | 74.5     | 78.00                         | 81.5                   | 75       | 78.02                         |                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Barometer<br>Sunrise.   | Barometer<br>9 A. M.   |          |                               | Barometer<br>Noon.   |          |                               | Barometer<br>3 P. M.   |          |                               | Barometer<br>Sunset.   |          |                               | Barometer<br>9 P. M.   |          |                               |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                         | Maximum.               | Minimum. | Min. of daily<br>observation. | Maximum.             | Minimum. | Min. of daily<br>observation. | Maximum.               | Minimum. | Min. of daily<br>observation. | Maximum.               | Minimum. | Min. of daily<br>observation. | Maximum.               | Minimum. | Min. of daily<br>observation. |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                         | 30.07                  | 29.91    | 29.972                        | 30.05                | 29.93    | 29.97                         | 30.02                  | 29.89    | 29.95                         | 30.03                  | 29.91    | 29.94                         | 30.07                  | 29.91    | 29.98                         |                                                                                                                                                                                                                                                                                                                                                                                                                           |

J. FAYRER, M. D.  
Assistant Surgeon, Field Hospital, Rangoon.



*Meteorological Register kept at the Field Hospital at Rangoon, for the Month of September, 1852.*

AT SUNRISE.

AT 9 A. M.

AT NOON.

| Date.  | Thermometer. |        | Force and direction of Wind. | Aspect of Sky.  | Thermometer. |        | Force and direction of Wind. | Aspect of Sky. | Anemoid. | Thermometer. |        | Force and direction of Wind. | Aspect of Sky.  |
|--------|--------------|--------|------------------------------|-----------------|--------------|--------|------------------------------|----------------|----------|--------------|--------|------------------------------|-----------------|
|        | Wet.         | Dry.   |                              |                 | Wet.         | Dry.   |                              |                |          | Wet.         | Dry.   |                              |                 |
| 1      | 77.5         | 79     | E. b. S. lt.                 | Cumuli.         | 79           | 84     | S. W. lt.                    | Cumuli.        | 29.98    | 77.5         | 84     | S. W. lt.                    | Cumuli.         |
| 2      | 78           | 79     | S. b. E. do.                 | Strati.         | 79           | 80     | Ditto.                       | Rain.          | .99      | 77.5         | 84     | Ditto fresh.                 | Cum.-strati.    |
| 3      | 77           | 77     | S. W. do.                    | Dense do.       | 76           | 76     | Ditto.                       | Ditto.         | 30.00    | 77           | 79     | Ditto lt.                    | Strati.         |
| 4      | 76           | 77     | S. E. do.                    | Cumulo-strati.  | 79           | 81.5   | S. E. do.                    | Cumulo-strati. | .01      | 78.5         | 79     | Ditto.                       | Cum.-strati.    |
| 5      | 76           | 77     | N. E. do.                    | Cumuli.         | 79.5         | 82.5   | Ditto.                       | Cumuli.        | .05      | 78.5         | 85     | E. b. S. do.                 | Cumuli.         |
| 6      | 77           | 79     | N. W. do.                    | Cirro-cumuli.   | 79.5         | 82     | S. W. do.                    | Ditto.         | .04      | 80.5         | 84.5   | S. W. do.                    | Thunder.        |
| 7      | 77.5         | 77.5   | S. E. do.                    | Cumulo-strati.  | 79           | 81     | N. E. do.                    | Ditto.         | .05      | 78           | 80     | Ditto.                       | Ditto.          |
| 8      | 77           | 79     | Ditto.                       | Ditto.          | ..           | ..     | ..                           | Ditto.         | ..       | 79           | 84.5   | Ditto.                       | Ditto.          |
| 9      | 76           | 77.5   | N. E. do.                    | Cirri.          | 79           | 84     | S. E. lt.                    | Ditto.         | .07      | 79           | 84     | Ditto.                       | Cum.-strati.    |
| 10     | 77           | 79.5   | East do.                     | Hazy.           | 79           | 84.5   | Ditto.                       | Ditto.         | .07      | 79           | 84     | E. b. S. do.                 | Cumuli thun.    |
| 11     | 76           | 77     | S. do.                       | Strati.         | 78           | 80     | N. W. do.                    | Clear.         | .04      | 79.5         | 83     | S. W. do.                    | Cum.-strati.    |
| 12     | 75           | 78.5   | N. E. do.                    | Thick fog.      | ..           | ..     | ..                           | ..             | ..       | 78           | 82     | E. do.                       | Ditto.          |
| 13     | 75           | 76     | Ditto.                       | Hazy.           | 77.5         | 82     | N. E. do.                    | Cumuli.        | .04      | 77.5         | 82     | N. E. do.                    | Cumuli.         |
| 14     | 76           | 76     | N. W. do.                    | Cumulo-strati.  | ..           | ..     | ..                           | ..             | ..       | 79           | 84     | S. E. do.                    | Ditto.          |
| 15     | 76           | 77     | West do.                     | Strati.         | 79.5         | 81     | N. W. do.                    | Cumuli.        | .03      | 76           | 76     | S. W. do.                    | Rain.           |
| 16     | 75.5         | 76.5   | N. b. W. do.                 | Cumulo-strati.  | 77.5         | 79.5   | S. b. W. do.                 | Ditto.         | .03      | 79           | 82.5   | Ditto.                       | Cumuli.         |
| 17     | 75           | 76     | South do.                    | Cirro-strati.   | 76           | 78     | S. do.                       | Ditto.         | 29.98    | 78.5         | 81     | Ditto.                       | Drizzling rain. |
| 18     | 75           | 76     | Ditto.                       | Ditto.          | 77.5         | 79.5   | S. W. fresh.                 | Rain.          | .98      | 76.5         | 78     | Sh. f. gale.                 | Rain.           |
| 19     | 75           | 76     | S. W. do.                    | Cumulo-strati.  | 79           | 80     | S. b. W. lt.                 | Cirro-strati.  | 30.05    | 80           | 84     | Ditto fresh.                 | Cum.-strati.    |
| 20     | 77           | 78     | South do.                    | Cirro-cumuli.   | 79           | 82.5   | S. do.                       | Cumuli.        | .07      | 79           | 87     | S. b. W. lt.                 | Cumuli.         |
| 21     | 78           | 79     | Ditto.                       | Ditto.          | ..           | ..     | ..                           | Ditto.         | ..       | ..           | ..     | ..                           | ..              |
| 22     | 78           | 79     | W. b. N. do.                 | Ditto.          | 78.5         | 82     | S. W. do.                    | Ditto.         | 30.03    | 79           | 83     | S. W. lt.                    | Cumuli.         |
| 23     | 74           | 75     | N. b. E. do.                 | Rain.           | 77.5         | 79     | Ditto.                       | Ditto.         | 30.00    | 79           | 83     | Ditto.                       | Ditto.          |
| 24     | 76.5         | 77.5   | E. b. N. do.                 | Cumuli.         | 78           | 81.5   | E. do.                       | Ditto.         | .04      | 77.5         | 82     | S. fresh.                    | Ditto.          |
| 25     | 74.5         | 76     | Ditto.                       | Cirro-strati.   | 79.5         | 82     | S. E. do.                    | Ditto.         | .03      | 78           | 86     | N. E. lt.                    | Ditto.          |
| 26     | 75           | 76.5   | E. do.                       | Thick fog.      | 78           | 82     | E. do.                       | Ditto.         | .07      | 79           | 86     | N. W. do.                    | Ditto.          |
| 27     | 76.5         | 80     | Ditto.                       | Cirro-cumuli.   | 78           | 82.5   | N. W. do.                    | Ditto.         | .07      | 79           | 90     | S. do.                       | Ditto.          |
| 28     | 78.5         | 81     | N. E. do.                    | Cumuli.         | 79           | 82.5   | N. E. do.                    | Ditto.         | .03      | 84           | 87     | N. do.                       | Ditto.          |
| 29     | 76.5         | 78     | S. W. do.                    | Thick fog.      | 78           | 83     | S. W. do.                    | Ditto.         | .04      | 80           | 86     | S. W. do.                    | Ditto.          |
| 30     | 76.5         | 77     | Ditto.                       | Fine and clear. | 78.5         | 81     | S. b. W. do.                 | Ditto.         | .10      | 80           | 89     | Sh. do.                      | Ditto.          |
| Total. | 2288.5       | 2327.5 |                              |                 | 2038.0       | 2113.5 |                              |                | 780.89   | 2283.0       | 2419.5 |                              |                 |
| Aver.  | 76.283       | 77.584 |                              |                 | 78.384       | 81.289 |                              |                | 30.034   | 78.724       | 83.431 |                              |                 |

30 observations.

26 observations.

Average of 29 observations.





# Meteorological Register kept at the Field Hospital, of Rangoon—(Continued.)



AT 3 P. M.

AT SUNSET.

AT 9 P. M.

| Thermometer. |        | Force and direction of Wind. | Aspect of Sky. | Thermometer. |        | Force and direction of Wind. | Aspect of Sky.     | Anemoid. | Thermometer. |        | Force and direction of Wind. | Aspect of Sky. | Rain Gauge, Inches. | Remarks.                             |
|--------------|--------|------------------------------|----------------|--------------|--------|------------------------------|--------------------|----------|--------------|--------|------------------------------|----------------|---------------------|--------------------------------------|
| Wet.         | Dry.   |                              |                | Wet.         | Dry.   |                              |                    |          | Wet.         | Dry.   |                              |                |                     |                                      |
| ..           | ..     | ..                           | ..             | ..           | ..     | ..                           | Heavy Rain.        | ..       | ..           | ..     | S. W. f.                     | Hvy. rain.     | 0.30                | Fresh breeze at Noon.                |
| ..           | ..     | S. W. lt.                    | Rain.          | 76           | 77     | 29.92                        | ..                 | 29.96    | 76           | 78     | S. E. lt.                    | Clear.         | 1.40                | Heavy rain in evening and at 9 P. M. |
| 77           | 79     | Ditto.                       | Strati.        | ..           | ..     | ..                           | ..                 | ..       | 77           | 78     | S. W. do.                    | Cumuli.        | 1.90                | Thunder at Sunset.                   |
| 77           | 79     | E. b. S. do.                 | Cumuli.        | 75           | 77     | 30.                          | Squally.           | 30.02    | 76           | 77.5   | S. E. do.                    | Ditto.         | 0.86                | Lightning at night.                  |
| 80           | 85     | S. W. do.                    | Ditto.         | ..           | ..     | ..                           | Thun. & lightning. | .04      | 81           | 79     | S. W. do.                    | Ltg. do.       | 0.55                | Thunder at noon.                     |
| 81           | 87     | Ditto.                       | Rain.          | ..           | ..     | ..                           | ..                 | .01      | 78           | 79.5   | S. E. do.                    | ..             | 0.10                | Ditto distant.                       |
| 75           | 77     | Ditto.                       | Cumuli.        | ..           | ..     | ..                           | ..                 | ..       | ..           | ..     | S. E. do.                    | Cir.-cum.      | 0.40                |                                      |
| 80.5         | 84     | S. E. do.                    | Ditto.         | ..           | ..     | ..                           | ..                 | .04      | 77           | 80     | Ditto.                       | Clear.         | 0.04                |                                      |
| 78           | 81     | S. do.                       | Ditto.         | ..           | ..     | ..                           | ..                 | 04.      | 77           | 80     | S. E. do.                    | Ditto.         | None.               |                                      |
| 79           | 82.5   | S. W. do.                    | Ditto.         | ..           | ..     | ..                           | ..                 | ..       | ..           | ..     | S. E. do.                    | Ditto.         | 0.04                |                                      |
| 76.5         | 78     | W. b. N. do.                 | Hvy. rain.     | ..           | ..     | ..                           | ..                 | .04      | 76.5         | 78     | Ditto.                       | Ditto.         | 0.40                |                                      |
| 79           | 82.5   | S. E. do.                    | Cumuli.        | 78.5         | 80.5   | 29.99                        | Cumuli.            | .02      | 77           | 79     | Ditto.                       | Ditto.         | 0.25                |                                      |
| 79.5         | 85.5   | S. E. do.                    | Rain.          | 78.5         | 81.5   | .99                          | Ditto.             | .02      | 77           | 79     | Ditto.                       | Ditto.         | 1.30                |                                      |
| 78           | 83     | Ditto.                       | Cumuli.        | ..           | ..     | ..                           | ..                 | .03      | 76.5         | 77.5   | Ditto.                       | Ditto.         | 0.04                |                                      |
| 76           | 77.5   | S. b. W. do.                 | Cum.-st.       | ..           | ..     | ..                           | ..                 | ..       | ..           | ..     | S. E. do.                    | Clear.         | 1.04                |                                      |
| ..           | ..     | ..                           | Cumuli.        | ..           | ..     | ..                           | ..                 | 29.98    | ..           | ..     | S. W. do.                    | Driz. rain.    | None in gauge.      |                                      |
| 78           | 83     | S. W. lt.                    | Strati.        | 76           | 79     | .92                          | Cum.-st.           | .98      | 75.5         | 77.5   | Ditto.                       | Ditto.         | 0.20                |                                      |
| 78           | 77     | S. W.                        | Cum.-st.       | 75           | 78.5   | .96                          | Hvy. rain.         | 30.02    | 76           | 79     | S. E. do.                    | Clear.         | 1.65                |                                      |
| 79           | 83.5   | S. b. W. f.                  | Cumuli.        | 76           | 77     | 30.00                        | Cumuli.            | .04      | 78           | 79     | S. do.                       | Cirri.         | None.               |                                      |
| 80           | 87     | S. lt.                       | Ditto.         | ..           | ..     | ..                           | ..                 | .07      | 78           | 80     | S. W. do.                    | Cumuli.        | 0.40                |                                      |
| ..           | ..     | ..                           | Thn. sto.      | ..           | ..     | ..                           | ..                 | ..       | ..           | ..     | S. E. do.                    | Ditto.         | 0.70                |                                      |
| 78.5         | 81     | S. W. lt.                    | Cum.-st.       | ..           | ..     | ..                           | ..                 | 30.00    | 76.5         | 78.5   | S. W. do.                    | Cumuli.        | None.               |                                      |
| ..           | ..     | Ditto.                       | Cumuli.        | ..           | ..     | ..                           | ..                 | ..       | 76           | 78     | S. E. do.                    | Ditto.         | 0.80                |                                      |
| 77.5         | 83     | Ditto.                       | Ditto.         | ..           | ..     | ..                           | ..                 | ..       | 80           | 83     | Ditto.                       | Cirri.         | None.               |                                      |
| 77           | 85     | S. b. E. do.                 | Ditto.         | ..           | ..     | ..                           | ..                 | .07      | 76.5         | 78     | S. W. do.                    | Ditto.         | 0.80                |                                      |
| 81           | 88     | E. b. S. do.                 | Very hot.      | ..           | ..     | ..                           | ..                 | .03      | 78           | 81     | S. do.                       | Ditto.         | None.               |                                      |
| 81           | 91     | S. W. do.                    | Ditto.         | ..           | ..     | ..                           | ..                 | .01      | 80.5         | 83.5   | S. W. do.                    | Cumuli.        | None.               |                                      |
| 78           | 87     | Ditto.                       | Ditto.         | ..           | ..     | ..                           | ..                 | .02      | 78           | 81     | S. W. do.                    | Cumuli.        | None.               |                                      |
| ..           | ..     | Ditto.                       | Ditto.         | ..           | ..     | ..                           | ..                 | ..       | ..           | ..     | S. W. do.                    | Cumuli.        | None.               |                                      |
| 78           | 84     | Ditto.                       | Ditto.         | 78           | 81     | 30.01                        | Cumuli.            | .07      | ..           | ..     | S. W. do.                    | Cumuli.        | 0.10                |                                      |
| 78           | 84     | Ditto.                       | Ditto.         | ..           | ..     | ..                           | ..                 | ..       | ..           | ..     | S. W. do.                    | Cumuli.        | 13.07               |                                      |
| 1960.5       | 2074.5 | 779.72                       | ..             | 613.0        | 631.5  | 239.79                       | ..                 | 720.52   | 1854.0       | 1894.5 | ..                           | ..             | ..                  |                                      |
| 78.42        | 82.98  | 29.9892                      | ..             | 76.628       | 78.938 | 29.9737                      | ..                 | 30.022   | 77.25        | 78.937 | ..                           | ..             | ..                  |                                      |

Aver. of 25 obs.

Average of 8 observations.

Average of 24 observations.

• Lightning in E. Cirro-cumuli alto.  
J. FAYRE, M. D.





## NOTE.

A good deal of rain fell during the early part of the month; on the afternoon and night of the 2nd it rained heavily; wind S. W.; Wet and dry bulbs equal.

The quantity of rain has been less than in former months, being only 13.07 inches, and that fell in 21 days.

The hotter part of the month has been clear and hot. The wind very unsteady, but varying chiefly between S. E. and S. W.; occasionally in the N. E. with squalls. There have been also a few thunder-storms.

Distant thunder frequently, and lightning at night. Since the latter part of the month, the air has been much dryer.

I remarked that on the 27th, the kites, which had been absent from this neighbourhood during the rains, made their re-appearance. This I have observed at Cheerra Poonjee to be a sign of the termination of the rains.

J. FAYRER.





*Hourly Observations commencing at Sunrise on the 21st September,  
1852.*

| Hours.        | Thermometer. |        | Aneroid<br>Barome-<br>ter. | Force and direc-<br>tion of Wind. | Aspect of<br>Sky.          | Rain guage and<br>Remarks.     |
|---------------|--------------|--------|----------------------------|-----------------------------------|----------------------------|--------------------------------|
|               | Wet.         | Dry.   |                            |                                   |                            |                                |
| Sun-<br>rise. | 78           | 79     | 30.06                      | S. W. very light.                 | Cirro-cumuli.              | Hazy.                          |
| 7             | 79.5         | 81.5   | .09                        | Ditto light.                      | Cumuli.                    | Fine morning but<br>cloudy.    |
| 8             | 80           | 83     | .08                        | West do.                          | Ditto.                     | Cloudy cool plea-<br>sant air. |
| 9             | 79.5         | 83     | .07                        | W. b. S. do.                      | Ditto.                     | Ditto.                         |
| 10            | 80           | 84.5   | .07                        | Ditto do.                         | Ditto.                     | Ditto close and<br>sultry.     |
| 11            | 80.5         | 86     | .06                        | West do.                          | Ditto.                     | Ditto.                         |
| 12            | 80           | 87     | .04                        | W. b. N. do.                      | Ditto.                     | Cloudy but cool<br>air.        |
| 1             | 80.5         | 88.5   | .02                        | West do.                          | Ditto.                     | Ditto very hot.                |
| 2             | 80           | 89.5   | .02                        | W. b. S. do.                      | Ditto.                     | Ditto.                         |
| 3             | 81           | 90.5   | 29.98                      | West do.                          | Ditto.                     | Ditto.                         |
| 4             | 81           | 87     | 29.99                      | S. W. do.                         | Ditto.                     | Ditto distant thun-<br>der.    |
| 5             | 81           | 87     | 30.                        | Ditto do.                         | Ditto.                     | Ditto.                         |
| 6             | 78           | 80     | 30.02                      | Ditto do.                         | Cumulo-strati.             | Rain thunder and<br>lightning. |
| 7             | 78           | 80     | .01                        | Ditto do.                         | Ditto.                     | Ditto.                         |
| 8             | 78           | 80     | .03                        | Ditto do.                         | Strati heavy<br>with rain. | Ditto.                         |
| 9             | 78           | 81     | .05                        | Ditto do.                         | Strati rain.               | Ditto.                         |
| 10            | 76.5         | 79     | .05                        | Ditto do.                         | Cumulo-strati.             | Ditto.                         |
| 11            | 76           | 78     | .04                        | Ditto do.                         | Ditto.                     | Cloudy thunder-<br>storm over. |
| 12            | 76           | 77     | .03                        | Ditto do.                         | Ditto.                     | Cloudy.                        |
| 1             |              |        |                            |                                   |                            |                                |
| 2             |              |        |                            |                                   |                            |                                |
| 3             |              |        |                            |                                   |                            | Rain fallen.                   |
| 4             | 78           | 79.5   | 30.00                      | W. N. W. light.                   | ....                       | 0.40 Inches.                   |
| 5             | 78           | 79.5   | 30.00                      | W. b. N. do.                      | ....                       | Cloudy and fine<br>weather.    |
| 6             | 78           | 80     | 30.02                      | Ditto do.                         |                            |                                |
| Total,        | 1735.5       | 18.205 | 66.073                     |                                   |                            | Rain.<br>Inches.               |
| Mean,         | 78.887       | 82.75  | 30.004                     |                                   |                            | 0.40                           |



*Abstract of the Meteorological Register for the month of September.*

*Rangoon, 1st October, 1852.*

| Thermometer<br>Sunrise.     | Thermometer<br>9 A. M.      | Thermometer<br>Noon.        | Thermometer<br>3 P. M.      | Thermometer<br>Sunset.     | Thermometer<br>9 P. M.      | Remarks.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum.                    | Maximum.                    | Maximum.                    | Maximum.                    | Maximum.                   | Maximum.                    | Quantity of rain fallen during the month, 13.07 Inches; fell in 21 days. This month has been dryer than the former; the latter part of it has been fine and very hot. Wind very unsteady in all quarters of the Compass, occasionally squally. A few thunder storms during the latter part of the month. Atmosphere much dryer, the wet and dry will indicate greater co-operation. On the 27 the kites returned, their first appearance since the rains set in. |
| Minimum.                    | Minimum.                    | Minimum.                    | Minimum.                    | Minimum.                   | Minimum.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Average of 30 observations. | Average of 26 observations. | Average of 29 observations. | Average of 25 observations. | Average of 8 observations. | Average of 24 observations. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 30.07                       | 30.10                       | 30.05                       | 30.05                       | 30.01                      | 30.07                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 29.95                       | 29.98                       | 29.93                       | 29.91                       | 29.92                      | 29.96                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 30.0177                     | 30.034                      | 30.001                      | 29.9892                     | 29.971                     | 30.022                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Maximum.                    | Maximum.                    | Maximum.                    | Maximum.                    | Maximum.                   | Maximum.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Minimum.                    | Minimum.                    | Minimum.                    | Minimum.                    | Minimum.                   | Minimum.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Average.                    | Average.                    | Average.                    | Average.                    | Average.                   | Average.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 30.0177                     | 30.034                      | 30.001                      | 29.9892                     | 29.971                     | 30.022                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Barometer<br>Sunrise.       | Barometer<br>9 A. M.        | Barometer<br>Noon.          | Barometer<br>3 P. M.        | Barometer<br>Sunset.       | Barometer<br>9 P. M.        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 81.76                       | 81.289                      | 83.431                      | 82.98                       | 78.938                     | 78.8555                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 77.584                      | 76                          | 76                          | 77                          | 77                         | 75.5                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 76.25                       | 76                          | 78.724                      | 75                          | 75                         | 76.628                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 78.74                       | 79.5                        | 84                          | 81                          | 81                         | 81                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Wet,....                    |                             |                             |                             |                            |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Dry,....                    |                             |                             |                             |                            |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

The mean Temperature as indicated by the dry bulb has been for the months May, June, July, August, September, 80° 2809, the result of the average of six observations daily throughout those months,

J. FAYRE, M. D.  
*Assistant Surgeon, Field Hospital, Rangoon.*





# PROCEEDINGS

## OF THE

# ASIATIC SOCIETY OF BENGAL,

### FOR OCTOBER, 1852.

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The usual Monthly Meeting was held on the 6th instant, at half-past 8 P. M.

WELBY JACKSON, Esq., Vice-President, in the Chair.

Rev. J. A. Parker was introduced as a visitor by the Secretary.

The proceedings of the last meeting were read and confirmed.

Received from Major Hugh Fraser and Lieut. E. C. S. Williams, Bengal Engineers, through Major W. E. Baker, a wrought iron gun from Burmah, of which the subjoined is a description by Major B. A drawing of the gun accompanies Major B.'s letter.

“ The gun is made of malleable iron and, though rough in form appears to be well or carefully forged. It is in two portions capable of being joined together by a screw, the connection being further secured by rings or hoops passing round each portion, and bolted together at the point of junction.

|                                          | cwt. | lbs. |
|------------------------------------------|------|------|
| “ The posterior portion, weighs, . . . . | 1    | 0 8  |
| “ The anterior, . . . . . „ . . . . .    | 1    | 0 6  |

“ Either of these would be a light load for a pony or bullock, and it was probably with a view to such mode of transport that the gun was thus divided.

“ The bore has a diameter of about  $1\frac{1}{2}$  inches.

“ The gun has no trunnions, but is furnished with two rings on the upper surface of the barrel, (not exactly in a line with the vent) by which it may have been designed to suspend the piece when in use like an eprouvette. The rings would also serve as handles whereby to lift the separate portions.



“The breech of the gun is not strengthened by the usual convexity ; it is in fact rather concave, and the thickness of metal at that point, though increased by the obliquity of the vent, is rather less than that of the barrel.

“The connecting screw, which is attached to the posterior portion, is very roughly and clumsily made ; but the female screw in the anterior portion, and which might be supposed to be more difficult of construction, appears to be much more correctly formed.”

The following gentlemen were named for ballot at the next meeting.

Dr. Christison ;—proposed by Dr. Falconer and seconded by Mr. Grote.

Manickjee Rustomjee, Esq. ;—(for re-election) proposed by Mr. Grote and seconded by the President.

The Council submitted the following reports—

1st. Recommending, at the suggestion of the Philological Committee, that the Arabic text of the *Fateh-ul-Shám of Wakidy* (Wakidy's Conquest of Syria), with an English translation by Ensign Lees, be published in the Bibliotheca Indica.

2nd. Recommending for adoption a suggestion from the Rev. J. Long, to the effect that information be collected regarding vernacular publications in different parts of India, and referring at the same time for the meeting's consideration, whether measures should not be taken for collecting in the Society's Library copies of all extant works in the different vernacular dialects of India. The report embodied Mr. Long's letter, which was as follows :

“I send an alphabetical Catalogue of Bengali books and pamphlets which have been printed within the last fifty years, amounting to about 1,100 ; many of them are translations from the Sanskrit or Persian.

“The history of Vernacular Literature, both as a branch of Oriental Literature, and as connected with the subject of Statistics, is one deserving the attention of a Society like the Asiatic. The French Government, a few years ago, sent a *savant* out to India to collect MSS. and books ; among these were copies of all the Mahráttá books published, and the Paris Société Asiatique did not think a list of these Mahráttá books unworthy of a place in its Journal.

“I have now nearly ready for press a *Catalogue Raisonné* of Ben-



gali works, but I am anxious to prefix to it tables giving the number of books on various subjects published in the chief vernacular languages of India, the Hindi, Urdu, Mahratta, Tamul, Telegu, Canarese, &c. &c.

“The attainment of this object would be greatly facilitated were the Society to address enquiries on the subject to influential individuals at Madras, Bombay, Agra, &c. &c.”

3rd. Recommending, with reference to a statement of stock of copies of the Researches, that the gratis distribution to members be stopped of all such volumes of which the stock shews less than 30 copies.

4th. Recommending, with reference to a letter from Government in the Foreign Department, sending a Memoir by Dr. Baddeley on the Dust Storms of the Punjab, that a reply be submitted in accordance with a report called for by the Council from Major Baker and Dr. Walker.

An extract from the report, which noticed the importance of the subject and spoke highly of the zeal and intelligence which the author had brought to bear on it, was then read to the meeting.

After some discussion it was resolved that the several recommendations of the Council be adopted.

Communications were received—

—From Captain Layard, enclosing a paper on the Mausoleum of Aliverdee Khan, near Berhampore.

Ordered to be printed in the Journal.

—From Mr. Bayley, announcing that the note on Bactrian Sculpture, which he had promised some time ago, is ready, and will be forwarded as soon as he is able to finish the illustrations; that he has lately examined some coins which he thinks he has identified as belonging to the Kotock kings of Kangra, and that he hopes soon to send to the Society, notes on some curious Bactrian coins and on some miscellaneous Pathan coins. He mentions further that a shock of earthquake was felt at Kangra on the 20th of August last, which lasted about 40 seconds.

“It was not felt,” adds Mr. B., “apparently *at all* in the plain; here it came with a loud terrible noise from the eastward; six marches eastward it was far more severely felt; seven distinct shocks were counted by an officer out shooting, all but one, however, slight. Here the shock took place about 9.12. A. M.”



From Major Baker, sending for inspection two sculptured heads given to him by Lieut.-Col. Napier, Bengal Engineers, and found (he believes) in the Northern District of the Punjab.

The following extract from his note describes the heads briefly as follows.

“ One of the heads appears to be of Grecian origin; the other is decidedly oriental in its character, and is said to be Buddhist.

“ The substance of these sculptures is not stone, but a species of lime cement or plaster, and it seems wonderful that one of them at least has so well retained its sharpness of outline.

“ It seems probable from the specimens having been found together and from the similarity of their composition, that they may have ornamented the same building, and in that case they would further illustrate the mixture of Grecian and Indian forms which characterizes so many of the sculptured remains from the same locality.”

—From Dr. Fayrer, Rangoon, sending a Meteorological Register kept at the Field Hospital, Rangoon, for the month of August, together with an abstract of similar Registers for the months of May, June and July.

—From Captain Hayes, enclosing a note on the *Ashkal ul Belad*, a work which is being published by Major Anderson, and of which Dr. Sprenger had requested him to compare the proof sheets with the MS. in the Motee Mehal Palace at Lucknow.

—From W. Muir, Esq., Agra, stating that the ancient coins alluded to by Major Kittoe will be forwarded to the Society, when returned by Mr. Bayley, with whom they now are, and enclosing copy of a letter from the last named gentleman regarding the same.

—From Captain Young, transmitting a paper, on the Laterite Formation in the neighbourhood of Rangoon, together with several specimens.

—From Mr. Blyth, submitting a paper entitled “ Remarks on the different species of the Ourang Outang.”

The Librarian submitted a list of works added to the Library during the month of September last.

Thanks having been voted for the above donations and communications, the meeting adjourned.

Read and confirmed, Nov. 3rd, 1852.

(Signed) J. W. COLVILLE.





## LIBRARY.

The following works have been added to the Library since the last meeting.

*Presented.*

Literaturgeschichte der Araber von ihrem Beginne bis zu Ende des zwölften Jahrhunderts der Hidschret. Von Baron von Hammer-Purgstall. Dritter Band. Wien 1852.—BY THE AUTHOR.

Selections from the Records of the Bengal Government, No. VIII. Report of the Examination of the Districts in the Damoodah Valley and Beerbhoom, producing iron ore. By T. Oldham, Esq.—BY THE GOVERNMENT OF BENGAL.

Journal of the Indian Archipelago for May and June, 1852, (2 copies each).—BY THE SAME.

Ditto ditto for June, 1852.—BY THE EDITOR.

The Benares Magazine, for June, 1852.—BY THE EDITOR.

Catalogue of the Library of the Royal Geographical Society, corrected to May, 1851.—BY THE SOCIETY.

Address at the Anniversary Meeting of the Royal Geographical Society, 24th May, 1852, by Sir R. J. Murchison.—BY THE SOCIETY.

The twenty-ninth Annual Report of the Royal Asiatic Society of Great Britain and Ireland, 1852.—BY THE SOCIETY.

Journal Asiatique, No. 90.—BY THE SOCIÉTÉ ASIATIQUE.

Journal of the Bombay Branch of the Royal Asiatic Society, No. XIII.—BY THE SOCIETY.

Geology of the Island of Bombay. By H. J. Carter. (Reprinted from the Journal of the Asiatic Society of Bombay, for July, 1852).—BY THE AUTHOR.

The Missionary, Vol. II. No. 11.—BY THE EDITOR.

The Oriental Baptist for September and October, 1852.—BY THE SAME.

The Calcutta Christian Observer for September and October, 1852.—BY THE EDITORS.

The Upadeshak, for September and October, 1852.—BY THE SAME.

The Aphorisms of the Nyāya Philosophy.—BY E. F. HALL, ESQ.

The Aphorisms of the Vedānta Philosophy, Part I.—BY THE SAME.

The Aphorisms of the Mīmāṃsā Philosophy, Part I.—BY THE SAME.

The Aphorisms of the Yoga Philosophy, Part I.—BY THE SAME.

The Aphorisms of the Sāṅkhya Philosophy, Part I.—BY THE SAME.

Reprints for the Pandits, No. 1, A Dialogue concerning Art, No. 2, Physical Science, No. 3, The Method of Induction, No. 4, Metaphysics and Mental Philosophy.—BY THE SAME.

A Lecture on the Sāṅkhya Philosophy, embracing the text of the Tattva Samāsa.—BY E. F. HALL, ESQ.

The Bhāṣhā Parichehkheda and Siddhānta Muktabālī, Part I.—BY THE SAME.





A Synopsis of Science; from the Standpoint of the Nyáya Philosophy  
Vol. I.—BY THE SAME.

The White Yayur Veda, Nos. 6 and 7.—BY DR. A. WEBER.

*Exchanged.*

The Philosophical Magazine, for August, 1852.

*Purchased.*

The Annals and Magazine of Natural History, No. 56.

The North British Review, No. 34.

Comptes Rendus, Nos. 1 to 4, for July, 1852.

#### FOR NOVEMBER, 1852.

The Society met on the 3rd instant, at half-past 8 P. M.

SIR JAMES COLVILLE, Knight, President, in the Chair.

Rev. Mr. Wallis was introduced as a visitor by Dr. Sprenger.

The proceedings of the last meeting were read and confirmed.

Presentations were received—

1st. From J. J. Akerman, Esq., Secretary to the Royal Society of Antiquaries. Archæologia, Vols. 33-4, and Proceedings of the Royal Society of Antiquaries, Vol. II.

2nd. From the Imperial Academy of Vienna, through its Bookseller Mr. Braumüller, the latest publications of the Academy.

The following gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected ordinary members.

*Manickjee Rustomjee, Esq.*

*Dr. A. Christison, B. M. S.*

Read a letter from Dr. Bedford, enclosing a paper on the Meteorology of Rampur Boaleah. Ordered for publication in the Journal.

Read the subjoined extract from a letter from the Rev. F. Mason, dated, Sea coast near Tavoy, 15th September, asking information regarding copies of the "Lat" character inscriptions, said to have been received by Mr. J. Prinsep, just before his death.

"I learned from the Journal several years ago, that just before Prinsep was taken sick, he had received fresh and more accurate copies of the Lat character Inscriptions, from which he was preparing a revised edition of his translations; but his untimely death prevented him from executing so desirable a work. Can you inform me whether the fac-similes and revised copies of the Inscriptions are still in the Library of the Asiatic Society? There are several places in the Inscriptions which it is exceedingly desirable to see accurately represented, as the words have an import-



ant bearing on the state of Buddhism at the time the Inscriptions were made. For instance at the close of the East compartment is the anomalous character and word

𑖦𑖩.

This Prinsep proposed to read as a compound for 𑖦𑖩<sup>𑖩</sup> *agnim, fire*. No such divinity is known to the Pali Buddhist books, so far as I am acquainted with them; and I am of opinion that that word is intended for 𑖦𑖩 *agga*, an epithet often applied to Gaudama, in the books, in the signification of being the first and most superior of beings. It is the Sanscrit word अग्र, and the *r* may be represented possibly in some way on the Inscription, though in book Pali it is always compensated by doubling the *g*. Nothing however can be determined from the passage with certainty till the word is more accurately represented.

It seems to me that some of the inscriptions which have been regarded as contemporaneous, are of different ages. For instance the inscription from Bhabra, in the Journal No. 102 (1840), which Capt. Kittoe referred to the age of Asoka, but, as it seems to me, on insufficient ground. It teems with modern Buddhistic theological terms, not one of which is found in Prinsep's inscription. Here we have 𑖦𑖩 *sangha* the congregation, 𑖦𑖩 *budha*, the Budha, 𑖦𑖩 *bhagava*, the Lord, and not only the common names of the begging priests and priestesses, but also 𑖦𑖩𑖩𑖩 *upāsaka* and 𑖦𑖩𑖩𑖩 *upāsikā*, men and women who perform their religious duties; with several other terms common to modern Buddhism. There is some difference too in the language. In the other inscriptions the causative verb is made by 𑖦𑖩 *pi*, but in this by 𑖦𑖩𑖩 *piya*. But a more exact copy is desirable to determine many words with certainty. The conjunction is repeatedly written 𑖦𑖩 *chā*, which is probably an error of transcription for 𑖦𑖩 *cha*. I fancy the Pundit's Sanscrit version will not be found an accurate translation of the Pali; although he is undoubtedly correct in the principal words on which the chief interest depends."

The Secretary explained to the meeting that as yet he had been unable to trace the receipt by Mr. Prinsep, of the further copies of the inscription alluded to by Mr. Mason.

Read letters from J. Barlow, Esq., Secretary to the Royal Institution, London, acknowledging receipt of the Journal Nos. 226 and 227.





From Dr. Fayer, Rangoon, enclosing a Meteorological Register kept at the Field Hospital, Rangoon, for the month of Sept. 1852.

The President took the opportunity of informing the meeting that the Council had directed enquiries to be made regarding the intended legacy to the Society, of the late Mr. Csoma De Koros, mention of which was to be found in the proceedings of the Society for February, 1842. It had been ascertained that under the recent Act the estate would remain in the hands of the Administrator General for fifteen years, on the expiry of which period the funds at its credit would be paid in to Government.

The Librarian submitted his usual monthly report.

Read and confirmed, 1st Dec. 1853. (Signed) J. W. COLVILE.

#### LIBRARY.

The following additions have been made to the Library since September last.

#### *Presented.*

Archæologia, vols. 33-34.—BY THE ROYAL SOCIETY OF ANTIQUARIES OF LONDON.

Proceedings of the Royal Society of Antiquaries, vols. II.—BY THE SAME.

Sitzungsberichte der kaiserlichen Academie der Wissenschaften. Philosophisch-historische Classe. Band VIII. ; I-II. u III. heft.—BY THE ACADEMY.

Ditto ditto, Mathematisch-naturwissenschaftliche Classe. Band VIII; III. Heft.—BY THE SAME.

Denkschriften der kaiserlichen Akademie der Wissenschaften. Philosophisch-hist. Classe. Band III.—BY THE SAME.

Ditto ditto, Mathematisch-naturwissenschaftliche Classe. III. Band III. Lieferung.—BY THE ACADEMY.

Kalender der Flora des Horizontes von Prag. Entworfen nach zehnjährigen Vegetations Beobachtungen von Karl Fritsch, 1852, 8vo.—BY THE SAME.

Tafeln zur Reduction der in Millimetern abgelesenen Barometerstände auf die Normaltemperatur von 0° Celsius. Berechnet von J. J. Pohl und J. Schabus. (Pamphlet).—BY THE SAME.

Tafeln zur Vergleichung und Reduction der in verschiedenen Lugenmassen abgelesenen Barometrostände, von J. J. Pohl und J. Schabus. (Pamphlet).—BY THE SAME.

Almanach der Kaiserlichen Akademie der Wissenschaften. Zweiter Jahrgang, 1852 —BY THE SAME.

Akademische Vorlesungen über indische Literaturgeschichte gehalten von A. Weber. Berlin 1852.—BY THE AUTHOR.





Journal Asiatique de Constantinople; rédigé et publié par Henry Cayol.  
Tome I.—BY THE PUBLISHER.

Lexicon Geographicum, cui titulus est, *مراصر الاطلاع على اسماء الامكنة البقاع*.  
Quantum fasciculum exhibentem literas Dál-zá. Edidit. T. G. J. Joynboll,  
Lugdini Bat. 1852.—BY THE CURATORS OF THE ACADEMY OF LEYDEN.

Quarterly Journal of the Geological Society, No. 31.—BY THE SOCIETY.

Journal of the Agri-Horticultural Society of India, vol. VIII. part II.—  
BY THE SAME.

The Oriental Baptist, No. 71.—BY THE EDITOR.

The Missionary, No. 12.—BY THE SAME.

The Upadeshak, No. 71.—BY THE SAME.

The Oriental Christian Spectator for September, 1852.—BY THE SAME.

The Calcutta Christian Observer for November, 1852.—BY THE EDITORS.

Lectures on the results of the Exhibition. Lecture XI. By Professor  
Royle. On the Arts and Manufactures of India, (2 copies).—BY THE GO-  
VERNMENT OF INDIA.

Madden's Catalogue of Books, 13 Nos.—BY MESSRS. LATTEY, BRO-  
THERS & Co.

A brief account of the Silk Manufacture of Lahore. By H. Cope, Esq.  
—BY THE AUTHOR.

Satyárnab, for September, 1852.—BY THE REV. J. LONG.

Bibidhártha Sangraha, No. 11.—BY THE EDITOR.

Tattwabodhiní Patriká, Nos. 110, 111.—BY THE TATTWABODHINI'  
SABHA'.

Thacker, Spink and Co.'s Monthly Overland Circular, No. 24.—BY THE  
PUBLISHERS.

Smith, Elder and Co.'s Literary Circular, No. 36.—BY THE SAME.

A Lecture on the Harmony between History and Prophecies, by Bábu  
Gyanendro Mohun Tagore. (Pamphlet)—BY THE AUTHOR.

Two Letters addressed to Edward B. Eastwick, containing sundry impor-  
tant corrections of that gentleman's recent lucubrations on the Bagh-o-  
Bahár. By Dr. Duncan Forbes.—BY THE AUTHOR.

Meteorological Register kept at the Surveyor General's Office, Calcutta,  
for the month of August, 1852.—BY THE DEPUTY SURVEYOR GENERAL.

The Citizen for October, 1852.—BY THE EDITOR.

*Purchased.*

Annals and Magazine of Natural History, No. 57.

Comptes Rendus, Nos. 5-6-7-8.

Journal des Savants for July, 1852.

*Exchanged.*

London, Edinburgh and Dublin Philosophical Magazine, No. 24.





## FOR DECEMBER, 1852.

At a meeting held on the 1st instant, at the usual hour and place,  
Sir JAMES COLVILLE, Kt. President, in the Chair,

The following gentlemen were introduced as visitors :

Right Rev. the Lord Bishop of Victoria, by the Lord Bishop of Calcutta.

Rev. T. V. French, by the Rev. W. Kay.

The proceedings of the last meeting were read and confirmed.

The following presents, received during the last month, were laid on the table.

1st. From Dr. Christison, Rangoon. Two specimens of the *Corydon sumatranus*, Raff. shot near Amherst.

2nd. From Professor Oldham. Two musical instruments of ingenious construction, one of them used by the Kashiya of Cherra Punji, and the other by the Kookees of Cachar.

3rd. From J. Muir, Esq. A Sanskrit tract entitled Mataparikshá, or an Examination of Religions. Part I. with an English translation.

4th. From E. A. Samuells, Esq. A sculptured figure of Vishnu, found some years back in excavating a tank at Bhowanipur.

5th. From Baron M. de Korff, Director of the Imperial Public Library at St. Petersburg, and Secretary of State, by order of his Imperial Majesty, Catalogue des Manuscrits et Xylographes Orientaux de Bibliothéque Impériale Publique de St. Petersburg.

6th. From Mr. Stainforth, through Captain Thuillier. Five silver coins with the brass pot in which they were found, and which was dug up from the ruins of Gour.

Copies of the Heads exhibited by Major Baker at the last meeting, kindly made by Mrs. Raleigh in China clay, were also placed on the table.

The Council submitted a report recommending, at the suggestion of the Philological Committee, that the offers of Dr. Ballantine and Mr. Hall to edit the *Sáñkhya Pravachana Bháshya* and to supply an English translation, and of Dr. Sprenger to edit an Arabic Dictionary of technical terms for publication in the Bibliotheca Indica, be accepted.

Ordered that the recommendation of the Council be adopted.

Communications were received—

—From E. C. Bayley, Esq. Kote Kangra, forwarding for the Journal, a memoir on Indo-Bactrian Antiquities, with thirteen drawings.





Resolved that the Society's best thanks be offered to Mr. Bayley for his interesting paper.

—From W. Muir, Esq., enclosing Meteorological Registers kept at the office of the Secretary to Government N. W. P., Agra, for the months of July, August and September last, and offering to send them regularly in future, should the Society agree to publish them in the Journal.

Resolved that the Society should gladly avail themselves of this offer.

—From Lieut. C. B. Young, Rangoon, announcing the dispatch of another collection of Geological specimens from Prome. The letter scarcely gives more than a hasty catalogue of the specimens, but the following extracts are of interest.

“ I will add one or two more specimens of shells by the next opportunity, from the calcareous sandstone of Prome in silex, one of which I should have considered to be ‘Producta,’ but that I believe, that it belongs to coal formations only.

“ I have found Chalk here in the bazars, which is said to come from Shaedown, a little South of Prome. If so, it will be interesting; Mica also of good quality, coloured with oxide of iron apparently, from about twenty miles North of Prome.”

—From A. R. Young, Esq., Under-Secretary to the Government of India, enclosing a catalogue of specimens illustrative of the Geology of the Salt Range in the Punjab, and of the Muree, Házará and Cashmere Hills.

—From P. Melvill, Esq., Secretary to the Board of Administration, Punjab, announcing dispatch of the specimens alluded to by Mr. Young.

—From Dr. Fayrer, Rangoon, submitting a Meteorological Register kept at that place for the month of October.

—From W. Muir, Esq., Secretary to Government N. W. P., forwarding copies of correspondence regarding twenty-one ancient silver coins found in the district of Benares, together with the coins themselves, which are to be deposited in the Museum of the Society until the pleasure of the Hon'ble Court of Directors be known.

The Curator of the Zoological Museum, and the Librarian submitted their usual monthly reports and the meeting adjourned.

Read and confirmed, 19th Jan. 1853.

(Signed) J. W. COLVILE.

#### LIBRARY.

The following books have been added to the Library since the last meeting.

#### PRESENTED.

Catalogue des Manuscrits et Xylographes Orientaux de la Bibliothèque





Imperiále publique de St. Pétersburgh. St. Petersburg, 1852, Imp. 8vo.  
—PRESENTED BY ORDER OF HIS MOST GRACIOUS MAJESTY THE EMPEROR OF RUSSIA,

History, Condition and Prospects of the Indian Tribes of the United States, by H. R. Schoolcraft. Part II. Philadelphia, 1852, 4to.—BY L. LEA, ESQ. COMMISSIONER OF INDIAN AFFAIRS.

Astronomical Observations made during the year 1846, at the National Observatory Washington, under the direction of Lieut. M. F. Maury, Vol. II. Washington 1851.—BY THE EDITOR.

Lieut. Maury's Investigations of the Winds and Currents of the Sea. Washington 1851, 4to. [2 copies.]—BY THE AUTHOR.

Selections from the Records of the Bengal Government No. VIII. Report of the Examination of the Districts in the Damoodah Valley and Birbhoom producing iron ore, by T. Oldham, Calcutta, 1852, 8vo.—BY THE AUTHOR.

An Investigation of the Dust Storms and Whirlwinds of India. By Dr. Baddeley, oblong folio.—BY THE GOVERNMENT OF BENGAL.

Transactions of the Bombay Geographical Society, Vol. X.—BY THE SOCIETY.

The Report of the British Association for the advancement of Science, for 1851. London 1852, 8vo.—BY THE ASSOCIATION.

#### PURCHASED.

Johnston's Physical Atlas—1 vol. Rl. fol.

Layard's Nineveh, 1 vol. Rl. fol.

Vaux's Nineveh and Persepolis, 8vo.

The Admiralty Manual of Scientific Enquiry, 1 vol. 8vo.

Huc's Travels in Tartary, &c. 2 vols. 12mo.

Ditto in the original French, 2 vols. 12mo.

Milman's Nala and Damayanti, 1 vol. 8vo.

Kautúka Taranginí, 1 vol. 12mo.

Vedántasára, 1 vol. 12mo.

Bráhmnyadharma, 1 vol. 12mo.

Arabya Upanyásha, 2 vols. 8vo.

Gyána Chandriká, 1 vol. 8vo.

Bhágavat Purán, 11th Chapter, 1 vol. 8vo.

Panchadasi, 1 vol. 8vo.

The Poems of Nasikh, Atash and Abád, 1 vol. 8vo.

Latáéf e Ajeebah, 1 vol. 8vo.

Faez Rashán, 1 vol. 8vo.

Khálek Bari, 1 vol. 8vo.

Qa Qatil, 1 vol. 8vo.

Gulistan e Musarrat, 1 vol. 8vo.

Chrestomathia Syriaca edid A Roediger. 1 vol. 8vo.

Zeitschrift für Vergleichende Sprachforschung. Herausgegeben von Dr. Aufrecht and Dr. Kuhn. 1st vol. 8vo. Berlin, 1850.

Koptische Grammatik von M. G. Schwartz, Berlin, 1850, 8vo.

Ibn Challakani vitae illustrum, edidit Ferdinandus Wüstenfeld. In two parts.

Beidhawii Commentarius in Coranum, in 6 parts.

Luise Königin von Preussen. 1 vol. 12mo.

Chronicle of the family of Rájá Krishnachandra. 1 vol. 8vo.

Pistis Sophia, 1 vol. 8vo.

Histoire des Berbers Par Kháldoun, in 2 parts.

Les Seances de Hariri. 1 vol. 8vo.

Dictionnaire Des Noms Des Vetements chez les Arabes.

Albrecht Weber's Yajur Veda. 6th and 7th parts, 20 copies.



# *Chronological Register kept at the Surveyor General's Office, Calcutta, for the Month of October, 1852.*

Observations made at Sun-rise.

Observations made at 10 A. M.

Observations made at Apparent Noon.

| Temperature. |         |          | Wind.                  | Aspect of Sky.       | Temperature. |         |          | Wind.                | Aspect of Sky.            | Bar. red. to 32° F. | Temperature. |         |          | Wind.              | Aspect of Sky.         |
|--------------|---------|----------|------------------------|----------------------|--------------|---------|----------|----------------------|---------------------------|---------------------|--------------|---------|----------|--------------------|------------------------|
| Of Mer.      | Of Air. | W. Bulb. | Direction at Sun-rise. |                      | Of Mer.      | Of Air. | W. Bulb. | Direction at 10 a.m. |                           |                     | Of Mer.      | Of Air. | W. Bulb. | Direction at Noon. |                        |
| 81.5         | 81.5    | 80.0     | S.                     | Clear                | 85.4         | 87.0    | 81.6     | S. W.                | Cirro-strati              | Inches 29.842       | 87.6         | 89.0    | 81.4     | S. W.              | Cirro-strati           |
| 82.0         | 82.5    | 81.5     | S.                     | Cumulo-strati        | 86.0         | 86.8    | 80.4     | W. S. W.             | Clear                     | .828                | 87.8         | 89.2    | 80.0     | W.                 | Clear                  |
| ..           | ..      | ..       | ....                   | .....                | ..           | ..      | ..       | ....                 | ....                      | .916                | ..           | ..      | ..       | ....               | Cumuli                 |
| 79.8         | 80.6    | 79.0     | W.                     | Clear                | 84.8         | 86.2    | 78.6     | W. S. W.             | Clear                     | .952                | 87.4         | 88.7    | 80.0     | W.                 | Ditto                  |
| 79.0         | 79.2    | 77.6     | W.                     | Cirro-strati         | 83.6         | 85.2    | 77.3     | N. W.                | Ditto                     | .977                | 86.6         | 88.4    | 78.6     | N. W.              | Ditto                  |
| 80.2         | 80.7    | 78.5     | S.                     | Clear                | 85.5         | 87.8    | 79.6     | N. N. E.             | Cumulo-strati             | .963                | 88.5         | 89.7    | 79.3     | N. N. E.           | Ditto                  |
| 81.8         | 82.4    | 80.8     | S. E.                  | Ditto                | 86.3         | 88.1    | 79.8     | N. E.                | Ditto                     | .950                | 89.4         | 90.5    | 79.7     | E. N. E.           | Cumulo-strati          |
| 81.3         | 81.6    | 79.9     | S. W.                  | Cirro-cumuli         | 86.7         | 88.3    | 81.6     | N. N. E.             | Ditto                     | .947                | 89.7         | 91.2    | 82.2     | N. E.              | Cumuli                 |
| ..           | ..      | ..       | ....                   | .....                | 87.0         | 88.5    | 80.0     | N. N. E.             | Cumuli                    | ..                  | 89.0         | 90.4    | 79.7     | N. E.              | Scattered-clouds       |
| 81.2         | 82.0    | 80.0     | S. E.                  | Clear                | 86.0         | 87.3    | 81.3     | N. N. W.             | Scattered-clouds          | .956                | 87.0         | 88.6    | 81.0     | S. S. W.           | Cumulo-strati          |
| 80.7         | 81.0    | 79.0     | S. W.                  | Cirro-cumuli         | 85.5         | 86.6    | 80.2     | W.                   | Cumuli                    | .923                | 86.8         | 88.4    | 80.6     | W. S. W.           | Ditto                  |
| 80.7         | 80.8    | 79.2     | S. S. W.               | Cirro-strati         | 85.6         | 87.0    | 80.8     | S. S. W.             | Ditto                     | .887                | 88.0         | 88.8    | 80.6     | W. S. W.           | Cumuli                 |
| 81.5         | 82.0    | 80.5     | N. N. E.               | Ditto                | 86.5         | 88.3    | 82.2     | S. W.                | Cirro-strati              | .869                | 88.0         | 89.5    | 81.0     | W.                 | Cirro-strati           |
| 80.8         | 81.7    | 80.0     | S. S. E.               | Cloudy               | 85.3         | 86.0    | 81.7     | E.                   | Cloudy                    | .858                | 87.4         | 88.4    | 81.6     | W. S. W.           | Cumulo-strati          |
| 79.4         | 79.7    | 77.8     | N.                     | Scattered-clouds     | 84.9         | 86.4    | 79.4     | N.                   | Cirri in the zenith       | .847                | 87.5         | 89.0    | 78.1     | N. N. W.           | Cml. in the S. E.      |
| ..           | ..      | ..       | ....                   | .....                | ..           | ..      | ..       | ....                 | ....                      | ..                  | ..           | ..      | ..       | ....               | ....                   |
| 77.0         | 77.5    | 75.8     | S. S. W.               | Clear                | 83.7         | 85.4    | 78.1     | W. S. W.             | Clear                     | .940                | 87.0         | 89.0    | 78.7     | S. W.              | Clear                  |
| 77.4         | 77.7    | 76.4     | Calm.                  | Ditto                | 84.1         | 85.6    | 78.1     | S. W.                | Ditto                     | .960                | 86.8         | 88.5    | 78.1     | S. W.              | Ditto                  |
| 77.0         | 77.0    | 75.3     | Calm.                  | Ditto                | 83.2         | 85.0    | 77.0     | S. S. W.             | Ditto                     | .972                | 86.0         | 88.0    | 76.2     | S. S. W.           | Cumuli                 |
| 77.0         | 77.1    | 75.0     | W.                     | Ditto                | 82.9         | 84.5    | 75.8     | E.                   | Ditto                     | .993                | 85.6         | 87.0    | 74.9     | E.                 | Ditto                  |
| 76.3         | 76.6    | 73.0     | Calm.                  | Scattered-clouds     | 83.4         | 85.3    | 75.4     | N. E.                | Cir.-cumuli in the [S. E. | 30.010              | 87.2         | 89.0    | 77.8     | N. N. E.           | Cumuli near the        |
| 76.3         | 76.2    | 74.8     | E. N. E.               | Cirro-strati         | 81.5         | 83.2    | 78.1     | E.                   | Cml. round the H.         | .016                | 84.3         | 85.0    | 78.1     | E.                 | Dense cumuli           |
| ..           | ..      | ..       | ....                   | .....                | ..           | ..      | ..       | ....                 | ....                      | ..                  | ..           | ..      | ..       | ....               | ....                   |
| 77.4         | 77.6    | 76.5     | ....                   | Cloudy               | 80.5         | 81.0    | 78.9     | E. S. E.             | Drizzling                 | .020                | 82.0         | 83.1    | 78.9     | S. S. E.           | Cumuli                 |
| 77.0         | 77.5    | 77.0     | Calm.                  | Cumulo-strati        | 79.3         | 81.0    | 78.0     | E.                   | Cumuli                    | 29.958              | 83.5         | 84.9    | 79.8     | S. E.              | Do [all o'er the sky   |
| 78.4         | 79.0    | 77.2     | W.                     | Cloudy               | 78.2         | 79.2    | 76.6     | N. W.                | Cloudy                    | .925                | 81.0         | 82.7    | 77.9     | N. W.              | C.-st. in Z. & cl.-sr. |
| 77.5         | 77.5    | 75.9     | N.                     | Cirro-strati [H.     | 82.2         | 83.8    | 78.0     | N. N. E.             | Cumuli                    | 30.004              | 89.3         | 89.8    | 78.8     | N. E.              | Scatd. cumuli          |
| 76.1         | 76.3    | 74.5     | N.                     | Cir.-st. near the E. | 81.8         | 83.5    | 77.1     | E. N. E.             | Scatd. cumuli             | .061                | 84.0         | 85.5    | 75.9     | N.                 | Cumuli [S. W. H.       |
| 74.6         | 75.3    | 73.7     | ....                   | Clear                | 80.4         | 82.2    | 75.0     | S. S. W.             | Cml. in the S. E.         | .032                | 83.4         | 85.3    | 75.0     | W. S. W.           | A Cumulus near the     |
| ..           | ..      | ..       | ....                   | .....                | ..           | ..      | ..       | ....                 | ....                      | ..                  | ..           | ..      | ..       | ....               | ....                   |
| 78.9         | 79.2    | 77.6     | ....                   | .....                | 83.8         | 85.4    | 78.9     | ....                 | .....                     | 29.946              | 6.           | 88.0    | 79.0     | ....               | .....                  |





